July/Aug. 1984

The Grape-growing & Winemaking Review

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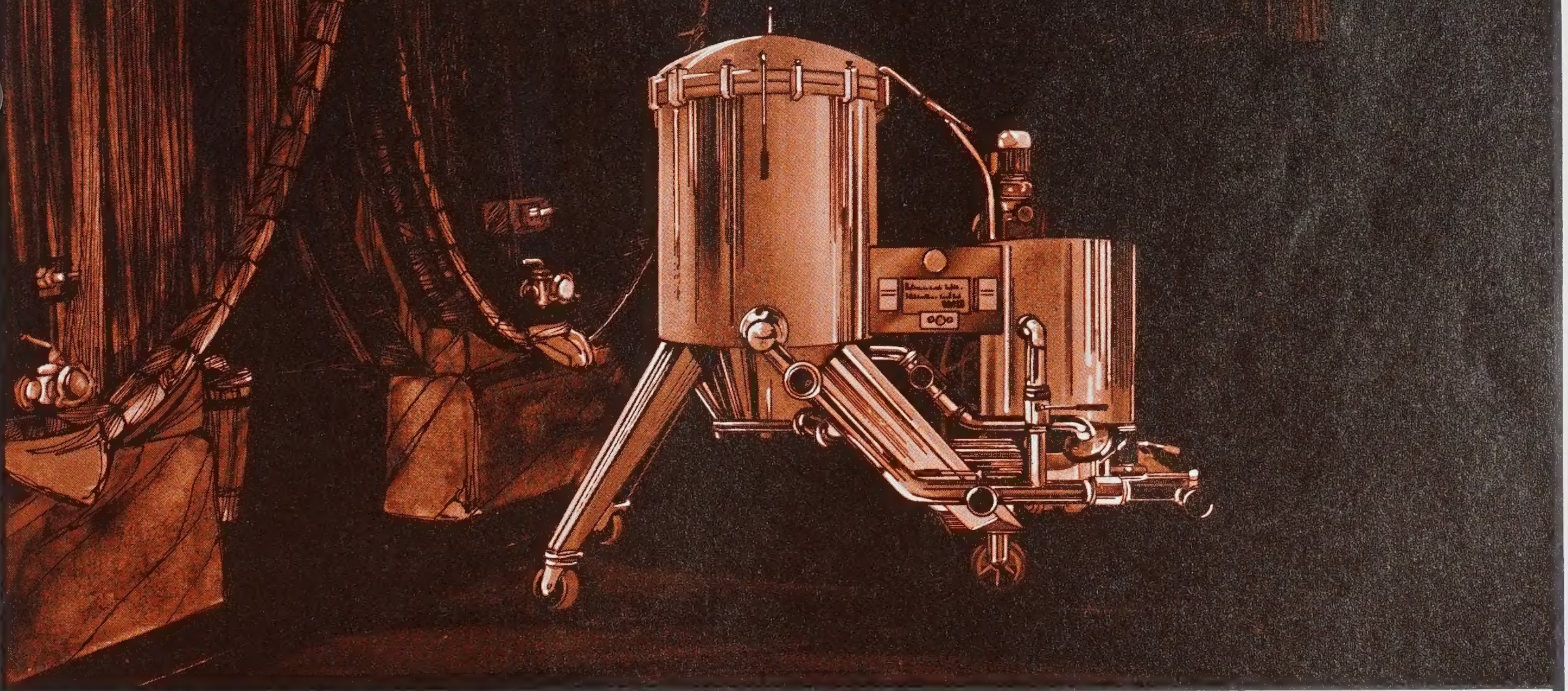

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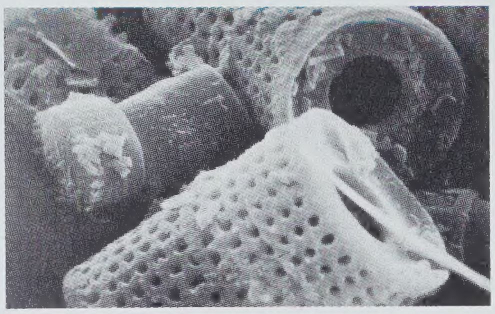

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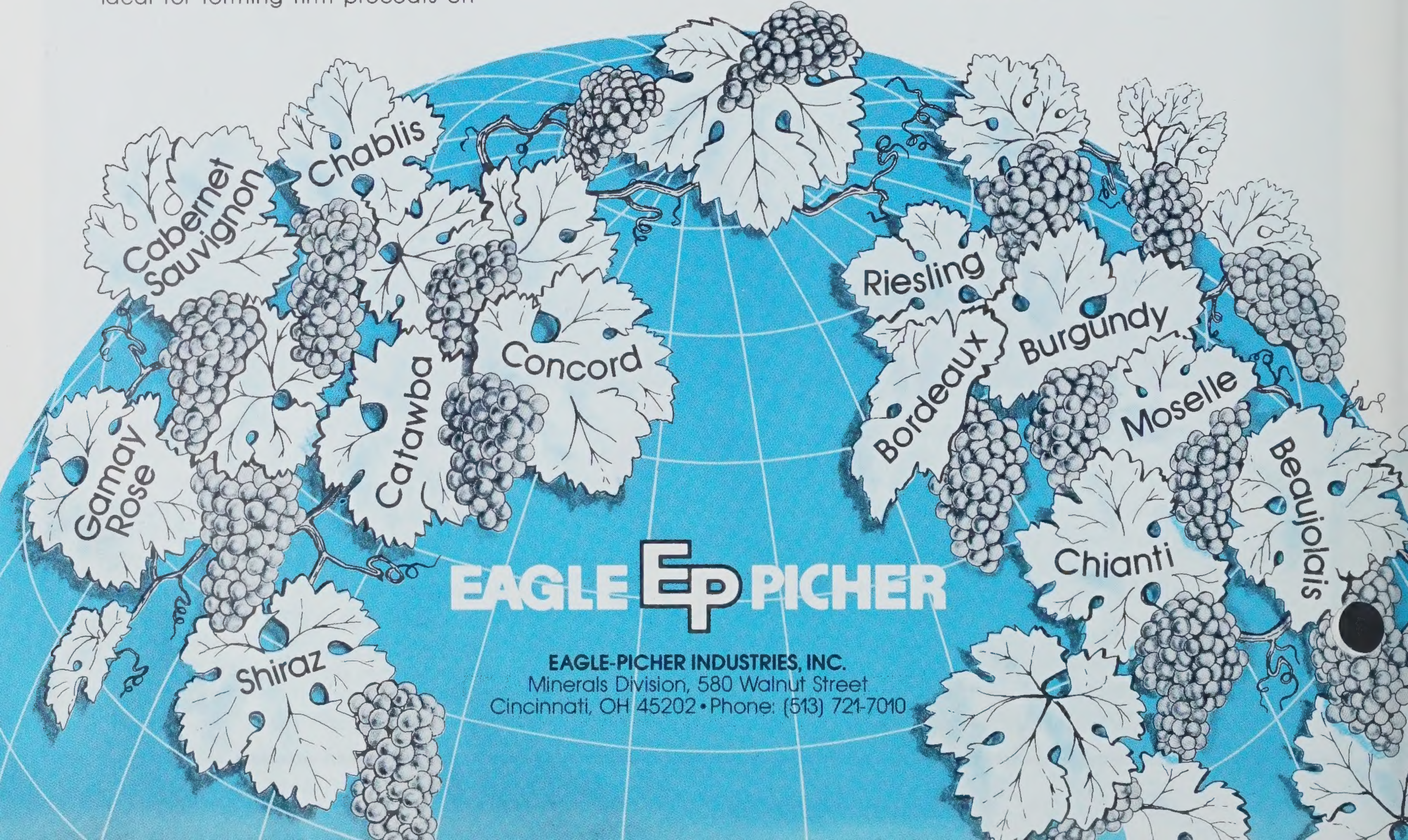

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The Grape-growing & Winemaking Review

PRACTICAL WINERY

JULY/AUGUST 1984 VOLUME V, NO. 2

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LETTERS TO THE EDITOR

Dear Editor,

It's been said that somebody in our Sonoma Valley winery admits to knowing Jake Lorenzo and so I was hoping they might know which gutter or derelict saloon he is calling home these days. I know the problem he has reading, but perhaps somebody could read this to him, or hold his hands steady while he reads it.

I just have one question for Jake. Who do you guys think you're kidding? It's not that I think the famous Napa Valley winery owner and the infamous Jake Lorenzo are liars or would perpetrate a hoax. No, I know that sort of thing doesn't exist in the Wine (amen) business. My question is, then, what have you two been smoking lately? Or is it that the two of you have never been closer to a California winery production area than a tasting room parking lot?

I guess most people actually don't know that grapes have legs. They would therefore tend to believe your story as recounted by the fNVwo (famous Napa Valley winery owner). In truth, I didn't myself know that grapes had legs until it was revealed to me one night by a close associate of Jake's. Knowing of that association, I took everything he said, of course, with a grain of alcohol. However, being a winemaker, I knew that grapes had indeed mysterious powers of moving themselves from one place to another. It was always one of those things you know but can't prove.

I know for example that I saw a 1967 grape hanging around in the middle of a pile of 1979 grapes. It was difficult to make positive identification with so much happening, so that sucker got away, and now I see him every year, usually about the following summer.

In any case, the legs theory made some sense to me and I accepted it, and in fact have done some research myself. It's true, I'm the first to say, that music is their Achilles' Peel. What is not true is that these California grapes would actually pay attention to a mere little flute. A flute might seduce the grapes that make one of those feminine French-like wines or nance sweet German ones. But no way is a tooth-fairy reed instrument going to have any effect on those babies that make the California wines.

With our power and depth and big varietal character, in fact, no single instrument could even turn the head of a California grape. You need a lot of instruments and volume—lots of volume. I use a four-slam-triple-decker-tweeter-tooter to drive my vibes. For a good full-bodied Pinot Noir I go for one of your more lusty string quartets (Beethoven) or maybe one of my son's Heavy Metal albums.

Your California Chardonnays, with their full varietal and high alcohol, need a full orchestra, preferably with a lot of percussion. And finally, of course, California's great monster mountain Cabernets are made with grapes of such brawn that nothing less than the forth movement of the Ninth Symphony (Ludwig again), or possibly Elvis' 'Jailhouse Rock', can make California fermenting rooms safe for cellarmen.

I hope this has enlightened Jake, as he has me on countless occasions. Just one bit of advice, though: Jake, lay off the Tequila. Try straight malt whiskey instead!

Anonymously yours,
A Rubber Boot Owner

IN MEMORIAM

Stephen Sinclair Scott died from cancer at age 37 on May 30, 1984. On return from Viet Nam, Scott did graduate work at UCLA. In 1975, he joined Scott Laboratories. He had a large number of friends all throughout the North American and European wine industries. Stephen is survived by his wife, Nori, two sons, David and Zachary, his parents Robert and Marjorie and two brothers and a sister.

Dieter Hartmann

Seitz Enzinger Noll Machines, Inc. (formerly SWK Machines), in order to consolidate resources and streamline operations, has relocated its headquarters from Bath, New York to their western division office in San Rafael, CA: 3095 Kerner Blvd., Suite G, 94901 (415) 457-5155 as of July 1, 1984.

Also effective July 1, Dieter Hartmann will replace Jurgen Koch as president of Seitz Enzinger Noll (SEN) Machines. Hartmann has been with SEN in Germany for nearly 20 years and has extensive knowledge and experience in the wine and fruit juice industries. SEN Machines, Inc. is the U.S. subsidiary of Seitz Enzinger Noll Filtration and Bottling Equipment, and Seitz Filter Works Filter Media, located in Bad Kreuznach, West Germany.

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FREE RUN

Anne Murphy

What most publicity fails to notice about the Napa Valley Wine Auction are the staggering efforts of damned near anyone associated with the Napa wine industry. Winemakers, vineyardists, bankers, attorneys, spouses, children, investors and lovers labor with the solid and spirited effort that is reminiscent of American pioneers. Generosity replaces competition, hospitality ignores the profit motive.

Now four years old, the event is *de rigueur* for the contemporary wine buff, retailer, collector, *upscale* restaurateur, international wine writer and languid voyeur. All sit in the steamy confines of a giant marquee that is centered on the lush green expanse of Meadowood Country Club, and watch paddleholders bid up for charity. (Two local hospitals and one bilingual clinic are beneficiaries.)

Guests inhale the rarified air, and saunter and purr, oblivious to the herculean endeavors of the volunteers and staff who put this event together. Hard work, and the temporary doffing of egos, allows the essence of community cooperation to pervade. It is an exercise of unsullied fraternity.

Committees include hospitality, logistics, visuals, legal advice, and finance. Each year seminars and tours of wineries are updated; each guest is briefed on current issues in viticulture and enology. The industry can only benefit from a well-informed consumer, and the staff for this auction sends the consumer back home better informed—and cossetted.

Some say the catalyst behind the auction is simply cunning marketing and a sapping-off of the authority of the Napa Valley mystique. But the unity of fervent farmers, cunning salesmen and enterprising winemakers suggests a common devotion to man's quest for community.

Stendhal said that 'fools think there are *nights* of passion, in reality there are only *moments* of passion.' If the wine industry has a moment of passion, the Napa Valley Wine Auction is it.

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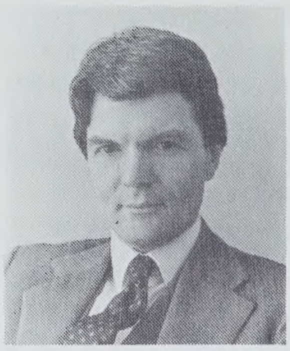

THE WINE LAWYER

R. Corbin Houchins

Wine Without A Winery

In the last column we considered a business plan which incorporated the idea of building a label before one builds a winery. Now we should look a little more closely at the legal consequences which flow from custom crushing and other methods of owning a wine brand without owning a winery.

Let's start with a time-honored form of brand creation, the private label. In the classic scenario, a chain store decides that it would like to have a price brand that is sold exclusively in its stores, so it contracts with Firesale Winery to supply wine bearing the brand name 'Chateau Cheapskate'.

Assumed Names

The brand name is owned, of course, by the chain which has registered it as its trademark. The bottling agreement includes a temporary trademark license, authorizing the winery to use the name as its business alias. The winery registers the alias if the law of its state has provision for fictitious name (as distinct from trademark) registration and amends its basic permit to show that it is doing business as ('DBA') Chateau Cheapskate, as well as in its own name. State law permitting (and antitrust issues aside), the wine is supplied only to the chain store which owns the brand.

If the chain wants to continue the program, it may or may not do further business with Firesale. Typically it will replenish from the cheapest acceptable source.

Premium Aliases

Needless to say, the foregoing business method does not convey a quality image. Today, however, some people see room for a higher-margin version. Many fine wineries have wines that for one reason or another do not fit into their own programs but which are quite salable in themselves or which might be blended with someone else's available wine to produce something better than either alone. Why not market it under a private label with the imagery of the Bristol wine merchant bringing in under his own name a select lot of claret that particularly impressed him?

There is certainly nothing illegal about such a scheme, which has been practiced in one form or another for several years, mainly in California, but there are some legal bases that need to be covered. Space does not permit doing more than touching on some of the considerations here; anyone contemplating a brand development program should be in touch with his legal adviser about trademark, commercial code and liquor law issues at the outset.

Licensing Issues

First, since the industry is regulated by both federal and state governments, the brand owner must make sure that it has the right to get the wine to the trade in the manner contemplated. Some states have laws requiring general distribution, rather than exclusive outlets, but that would not normally be an impediment to such a program. All states, however, license the sale of wine, and it is essential that the brand owner be, or have a proper commercial relationship with, the holder of a suitable license and of the necessary federal basic permit.

If state law permits the winery to distribute directly to intended customers and the winery has capacity to do so, distribution can be handled in the bottling agreement. If a middleman is required, either by state law or by commercial necessity, a distribution agreement is called for. In either case, care must be taken to maintain the brand owner's control of the brand and right to obtain wine from other sources.

Distribution Contracts

Distribution agreements require forethought on the question of whose distributor the wholesaler is. Few special problems arise if the wholesaler is the brand owner, but a three-party deal raises issues about the right of the wholesaler to distribute the same brand from other sources or the same wine under different brands.

Purchase Contracts

Secondly, a private label program requires both business savvy and good contracts to assure continuity of product. Provisions of the Uniform Commerical Code applicable to sale of goods between merchants will control such issues as conformity of goods delivered to samples used to make the buying decision unless other specific provisions are included. In the case of wine intended to be sold at a higher price than Chateau Cheapskate, those provisions are not adequate.

Peole who are excellent at handling and treating wine within a single cellar may not be able to produce a product of consistent quality under *eleveur* conditions. The agreement should state objective standards backed up with a provision making the report of a good consultant you select conclusive on the issue of conformity to sample both as to lab work and taste panel results. The supplier should be obliged to submit the wine for analysis if requested each time it is handled.

Winemakers as Brand Owners

What if the brand owner wants a more intimate relationship with the wine than that of *negociant*? What if the wine is to be marketed as his aesthetic creation, made by him at someone else's winery, perhaps as a temporary measure while his own outfit is being put together?

Let's look first at how not to do it. When the wine grape market in California went soft a few years ago, some growers decided to store their production as wine. There were several wineries about that had not been used for some time but which had a current basic permit. In some cases the owners were absent and willing to let someone else use the facility. Why not just borrow the premises and make wine?

Regulatory Compliance

The principal legal issue in just using someone else's winery is responsibility to the regulatory authorities for cellar records and control of the premises for protection of the revenues. Lending a basic permit to someone else is grounds for automatic cancellation. The feds are very serious about collection of the gallonage tax and require prior approval of any rent-a-winery activity. Moreover, winemaking privileges under most state licensing laws are personal to the holder, so the fact that a facility is owned by someone with a license does not necessarily entitle another person to make wine there.

In the case of the wineries borrowed by growers the regulatory agencies had no one who was 'on' the basic permit or state license who could vouch for the cellar records. Varietal wine made on the premises under those conditions could be sold only as generic. It couldn't even be called California wine since there was no acceptable documentation of the source of the grapes.

Bureaucratic Croquet

While the sad story of the unintended 'American Red' seems to have put some people off custom crushing deals, there is really no resaon why growers or others should not make their own wine at existing wineries, so long as they go through the legal wickets. Before picking, decide on whether the wine can be made by the existing permit/license holder under your guidance and bottled under your *DBA*, or whether you will have to be the actual winemaker.

The circumstances under which the latter arrangement is necessary are rare. From a marketing standpoint, aesthetic control is normally the main issue. As long as the actual permittee is responsible for the taxes and the cellar records, the feds will not be offended if you stand over the shoulder of every person involved at every step, or even if you hire yourself to the permittee (who can stay on the beach in Acapulco if he likes) as an employee or contractor and do the work yourself.

State Law Pitfalls

A greater degree of control than that may be in order if it is significant that the wine be technically of the brand owner's own production'. Although that phrase is still defined in the Internal Revenue Code, its use in the regs has been largely deleted. The only federal application that comes to mind might be in determining whether a brand owner is entitled to the bonded wine cellar exemption from special occupational tax stamp as a liquor dealer.

State law is another matter, since wineries may have different license privileges in dealing in their own wines versus those made by others. If the brand owner intends to cancel the trademark license and use the brand himself in his own winery at a time when some of the made-elsewhere wine is still around, he needs to be sure that it will qualify to be sold interchangeably. That determination should be made before the first custom crush.

Labelling

Private label arrangements may affect mandatory label copy. If the wine is produced and bottled at the same winery, there will be no apparent difference between the identity of the producer-bottler operating under his own name and that of a different person or company using the name as a *DBA*, other than the bottling address (or principal place of business address plus registery number). If two or more wineries that use the same *DBA* in succession are in the same town, it would seem possible to use identical labels, although an issue of consumer deception could be raised. Even if identical labels are found to be deceptive, a change in the name slight enough to maintain marketing continuity should be sufficient to cure the problem.

Bottling at a different winery raises a few more issues. Ordinarily, the producing winery and the bottling winery cannot have the same *DBA* on their basic permits at the same time. The usual solutions are (a) to alter the *DBA* slightly, resulting in a rather long statement such as 'Produced by Chateau Upscale Vineyards, Lansing, Michigan; bottled by Chateau Upscale Cellars, Detroit, Michigan' or (b) leave off the place of production, ending up with something like 'Cellared and bottled by Chateau Upscale, Detroit, Michigan'. Some people feel that talking only about cellaring and bottling the wine on a label lacks class, so one finds neologisms like 'vinted' which has entered the vocabulary as a synonym for cellared.

Another problem arises if a grower/winemaker who wants to use 'estate bottled' on his plans to crush at a facility that does not have bottling capacity. Unless the winery that did all the things set forth in Regs 4.26 (a) (3) acquires a bottling line by the time the wine is ready for glass, it will be necessary to obtain an amended premises designation and bring a bottling line in for the event.

The Bottom Line

While custom crushing and bottling involve some headaches, the flexibility they offer and the potential for reduction in capital expenditures justify the high current level of interest. Just make sure you have your program wired before the grapes arive!

R. Corbin Houchins is a partner in the national liquor law firm, Duryea & Houchins, with offices in San Mateo, CA and Olympia, WA. His column is not intended as legal advice, nor does it necessarily represent views of regulatory agencies on concepts presented. Readers who would like to submit specific questions for discussion in future columns are invited to send them to Houchins in care of PRACTICAL WINERY.

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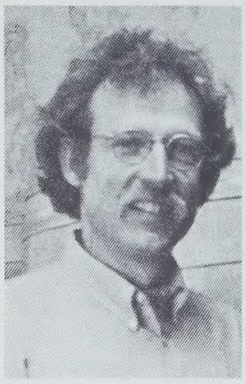

Q&A's

Quality Approach

Bruce Rector

Consulting Enologist

Q: High pH must was our biggest problem in the 1983 harvest. What should I do if we receive high pH musts again this year?

A: First, **don't** wait until you have received the must to start your strategy. pH is a big problem and no single action is going to correct everything.

Start in the vineyard. Let me touch on some of the highlights from the Viticulture for Enologist seminar at the Napa Valley School of Cellaring. Louis Lucas brought up some interesting observations that can start at planting time: soil amendments to lower soil pH, vine spacing to cause greater competition of the roots which apparently contributes to lowering pH, and drainage – using proper tiling or subterranean drainage to have better control over soil moisture. Remember, these are some of the contributing factors, not the 'answers'. They can even work in reverse given the interplay of other elements.

pH of irrigation water comes into play, particularly when mechanical harvesting is used. If you are using overhead sprinklers and your water is basic, as the water evaporates from the leaves and berries it leaves its basic salts. With mechanical harvesting there can be enough juicing that these salts are washed off the leaves and start the base titration that neutralizes acidity.

I have seen this first hand where I was hand-picking vineyard samples, and could predict the °Brix 0.1 degree. The TA was right on but my pH's were 0.3 units lower than the mechanically harvested crop. This was quite a disappointment to a 'fan' of mechanically harvested fruit. I like mechanical harvesting because it potentially can bring in fruit cleaner, colder, and have less rot if the blowers on the harvester are properly adjusted.

This overhead sprinkler case is corrected by acidifying the irrigation water. This is most economically done with N-phuric acid. Irrigation timing is an important factor. In the worst case I have seen pH's skyrocket as a grower late-irrigates to try and plump-up dessicated berries. This opened up the biological pathway for the cells within the berry to pump out H^+ and transport in K^+ and start the base titration again. A modest, tapering irrigation program should be started prior to bloom. Leaf surface area as controlled by pruning, trellising and hedging may also be a contributing pH factor.

Picking time is the most dramatic pH controlling option we have open to us as other options become history. Here is where the powerful and typically ignored option of fractional harvesting come into play.

If we pick half of the crop at 3.2 pH and half of the crop at 3.6 pH, and blend them together, do we get a pH of 3.4? **No.** pH is a logarithmic scale so the 3.2 has many more H^+'s floating around and it will skew the resulting blend much closer to 3.3 (depending on a number of other factors). Blending to lower pH is an underrated solution, but it takes a lot of courage to go out and harvest fruit that is not mature.

Suppose you are at the crusher, all previous options mentioned no longer applicable, now what can you do? There are two main considerations: #1 How well buffered is the must? #2 Are we going to be able to inhibit the malolactic fermentation (MLF) downstream during ageing?

Taking the MLF question first, you should get a feel for how much malic acid is in the must. The more malic acid, the more the pH may shift after ML fermentation. The best way to determine the malic acid content is by enzymatic analysis. If this is not available, realize that the cooler the nights and region, and overall growing season of that vintage, the more

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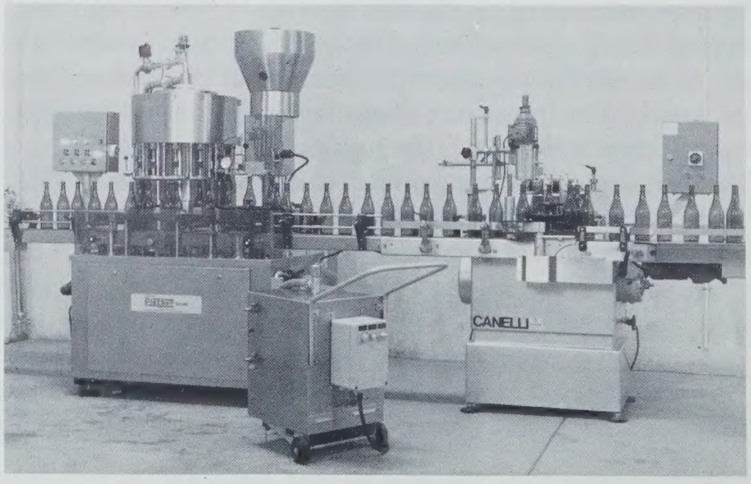

Bottling Line Installed at Whitehall Lane, St. Helena, CA

malic will remain in the grapes. Paper chromatography can also give you a very crude, relative amount of malic vs. tartaric acid. If the pH is high and the malic is high, then MLF must be avoided.

A general strategy to inhibit MLF would be: not to inadvertantly innoculate with ML bacteria, keep SO_2's up to the 0.8 molecular figure compensating for the pH, keep the wine as cool as possible, rack off the lees early, fine and filter early, keep it out of wood, and finally, once all the sugar is consumed and the yeast have been eliminated, judiciously consider a fumaric acid addition. You will need to completely dissolve 5-8 lbs/1,000 gallons, with the higher figure being used for higher pH wines. Sterile filtration is necessary at bottling.

If you still cannot control the MLF, then you have that much more work ahead of you lowering the pH even more, perhaps an impossible task because the wine is too well-buffered. A principal foe of dropping a pH is the buffering capacity of the tartrate ion. Reference the pH story in the Jan/Feb 1984 PW by Robert Beelman and the May/June 1983 PW story by James Vahl.

Tartaric acid enters into an equilibrium that plays a major part of controlling the pH and the buffering, which is the ability of a solution to resist pH change be sequestering added H^+'s. The tartaric acid equilibrium is just like the sulfite equilibrium described in the March/April 1984 PW Q&A. We have:

$$\underset{\text{tartaric acid}}{\underset{\text{undissociated}}{H_2Ta}} \qquad \underset{\text{bitartrate}}{H^+ + HTa^-} \qquad \underset{\text{tartrate}}{2HT^+ + Ta^{--}}$$

The bitartrate form is the most numerous. However, as we saw with sulfite, these interconnected fish bowls represent equilibriums that can have their 'volumes' changed by pH. So the higher the pH (3.6 going to 3.9), the more this equilibrium is pushed to the right, the larger the tartrate fish bowl becomes.

In high pH situations there is an abundance of tartrate which reacts with any additional tartaric acid we add in the following way. If all things were equal when we add H_2Ta, one H^+ comes off and one H^+ remains with the acid anion to form HTa^-. The one H^+ that is/was floating around would have caused a net increase in the H^+ concentration, and therefore would have lowered the pH.

In the high pH case, the tartrate form interferes with this; it finds the H^+, reacts with it and becomes HTa^-. It sequesters the added HT^+. By adding tartaric acid we have increased the titratable acidity, which contributes to the tart taste, but we have not lowered the pH.

How can we make our foe Tartrate, jump out of its fishbowl? You can go fishing with gypsum, (calcium sulfate [$CaSO_4$]). This is on the Generally Regarded As Safe (GRAS) list, but you should verify the legal limitations in your state before adding it. It is typically used in sherry production and will give the wine more Ca^{++} and SO_4^{--}. The latter is frequently found in bottled mineral waters and if overdone in wine, it will give the wine a mineral-like taste. The Ca^{++} is what we are interested in to form calcium tartrate. The Ca^{++} gets tougher with Ta^{--} to form crystals and precipitate out.

This treatment is only for severe cases (above 3.7 at harvest) and has it's taste trade-offs and subsequent stability problems. If there is an excess of Ca^{--}, these tartrate crystals can form in the bottle also. Calcium tartrate crystals, although digestively harmless, look much nastier than the usual potassium bitartrate crystals we are used to see adhering to a cork. For openers, they won't adhere to the cork and are not removed when the cork is pulled.

In general, to get crystalizing precipitate reactions to occur we want to have the solution as cold as possible and would like to provide some of the actual crystals, ground as finely as possible to act as nucleation sites for the growing of the crystals. The bad news is that calcium tartrate does not precipitate out nearly as easily as potassium bitartrate. In fact, it doesn't really respond very well to seeding or chilling, so caution is advised.

Now the plot thickens, tartrate is not the only villain in the high-pH drama. Malate can have just as big of an impact under certain circumstances, like the high TA/high pH case. What we would like to do here is get both the malate and tartrate to jump out of their fish bowls, so we go fishing with calcium carbonate ($CaCO_3$), i.e. double-salt precipitation, rather than calcium sulfate.

Remember all of these treatments are best done prior to fermentation and done on the juice which is much more resiliant to treatment than wine. For the calcium carbonate (i.e. double-salt precipitation, Acidex) approach, we want to only treat a portion of the juice for two reasons:

1. We are going to have to raise the pH of that portion of juice to about 5 in order to shift the equilibrium more to the right (tartrate, malate form) to get the fish into the right bowl. In addition, the higher pH is needed to make the double salt of calcium-tartrate-malate (Ca_2TaMa) form and precipitate out.

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2. We are going to have to filter that portion of juice to make sure we aren't adding any calcium carbonate crystals to the main batch. We want to filter so that none of the calcium/tartrate/malate crystals get in which would redissolve and we would be worse off than when we started.

The percentage of the batch we treat is proportional to the severity of the problem. The range will typically be 20-35%. This procedure may sound inverted to you because we are lowering the TA and increasing the pH slightly with the calcium carbonate step. But, remember what we are doing is trying to remove the buffering capacity of the juice. We will add back tartaric acid to drop the pH and increase the TA. Don't get nervous with the high TA values, they will come down during cold stabilization if we can get the pH below 3.6.

Here's the recipe:

1. Treat 20-35% of the settled juice with calcium carbonate. Follow the Acidex instructions for amounts and procedures. Agitate at 60-65°F until the CO_2 evolution stops. If possible, chill to help settle.
2. Filter the treated juice fraction through medium-coarse diatomaceous earth.
3. Add the filtered fraction back to the main batch.
4. Adjust the entire batch pH to 3.6 or lower using tartaric acid. Bear in mind that subsequent cold stabilization will lower the TA and the pH further.

The real pH number we want to keep aware of is pH 3.6. If we are below this value and we cold-stabilize, the pH will drop even more. Above 3.7, the reverse can happen. I recommend that you cold-stabilize prior to the possibility of MLF. But be aware that the protein stability (heat stability) can be affected by a pH shift. Always try to test cellar procedures with lab trials first.

If at the end of cold stabilization the wine is still too tart for bottling consider blending, adding small amounts of residual sugar, or treating with potassium carbonate to further reduce the TA and to some degree increase the pH.

If all of this sounds like a lot of work – you're right! You are dealing with buffered acid solutions and are trying to correct the problem with weak acids (ones that don't fully give up their H^+'s).

The wine industry should be afforded the same privilege as the rest of the food industry by being able to use a strong acid such as phosphoric acid. This is a commonly seen ingredient without health drawbacks. Then, when you add acid, all of the H^+'s would be working to lower pH and you could minimize increases in TA.

Whatever you do, don't underestimate the impact of a high pH wine. High pH's make ponderous wines, at best you can't decide if you like them or not, but no one ever buys a second bottle to try and help themselves make up their minds.

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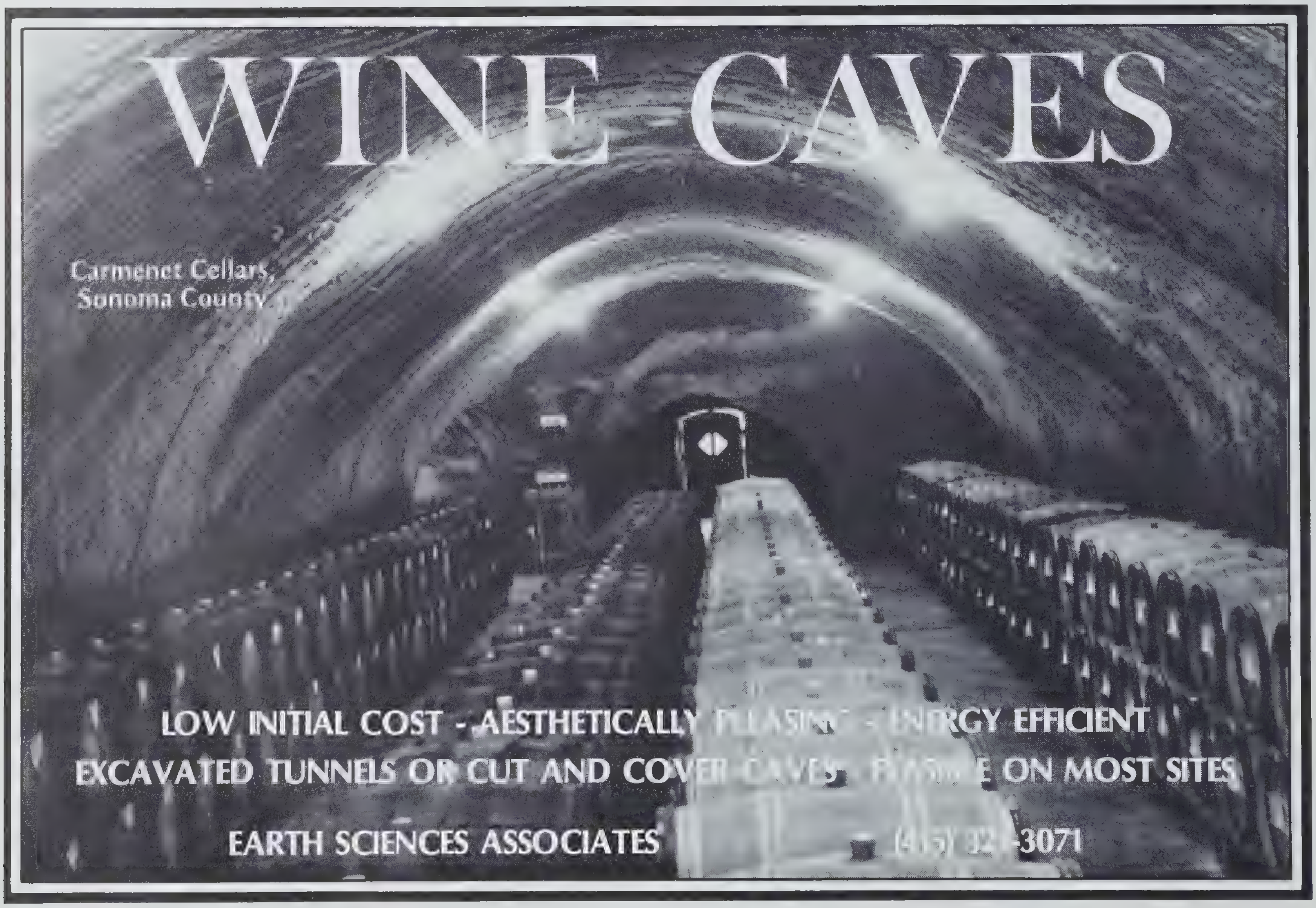
Don't forget to send in any recommendations for concrete sealers and paints so we can share your secret with the rest of the crew! Bruce H. Rector is a consulting enologist with clients from Pennsylvania to Texas to Sonoma. He is also a director of the Napa Valley School of Cellaring. Please send questions to Bruce H. Rector, PO Box 235, Napa, CA 94559, or to PRACTICAL WINERY – only one question per subscription-renewal please!



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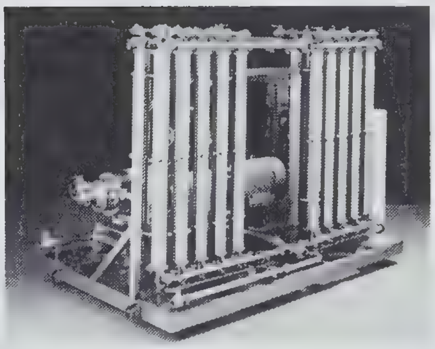

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MILLIPORE

DETERMINING GRAPE MATURITY

By Mike Marcley

Winemaking begins in the vineyard where sugar, acid, color, tannin, flavor and aromatic constituents develop and pH changes in the individual berries. In order to capture these constituents at optimum levels and make high quality wines, the winemaker must be able to assess grape maturity accurately.

A precise method is to sample grapes at various times during maturation and analyze the juice for constituents that will indicate resulting wine quality. Since sugar, acid and pH are easily measured and relate in a general way to wine quality, vintners depend on the results of these measurements to determine both grape maturity and value.

But there is also an increasing awareness of flavor as an important factor. Winemakers are willing to pay top price for grapes within a 2-3° Brix range to assure optimum flavor.

In some years and in some regions actual grape maturity in terms of flavor is reached before targets for sugar, acid and pH have been reached. In these cases, waiting for specific numbers would result in the loss of some special fruit and wine qualities.

In most years a range of maturity levels is attainable for most grape varieties, including the late-maturing Cabernet Sauvignon. Winemakers can choose the style of wine they desire and determine picking accordingly.

Fortunately, numbers are not the sole criteria. Vineyard, vine and grape appearance, berry texture, juice flavor, aroma and color—and in some cases, tartrate/malate ratios—are also measured before harvest dates are set. By consulting with growers and/or vineyard managers, winemakers become familiar with the vineyards and the range of fruit flavors that each can produce.

Opinions from vintners and vineyard managers vary. This survey on grape maturity explores current practices.

Beringer Vineyards, CA

PW: How do you determine grape maturity?

Bob Steinhauer: We follow the numbers pretty closely, but we're also looking at the condition of the fruit, the vineyard, and the growing season. It's one thing to aim at 23° Brix, but if the vine isn't capable of that sugar level in a particular year, it's no good waiting for the sugar to develop while the acids and pH go crazy. We sample frequently and relate this information to the vines. We don't just look at sugars, we track the movement of acid and pH as well. We begin sampling when the sugars reach 18° Brix. First it is weekly, but as we get closer to our targets, we sample more often. Sometimes we'll sample fifteen times in a given vineyard in one season.

We relate our sampling to the weather, the vineyard and the soil type. You can get a two-degree range in Brix readings from morning and afternoon samplings. We try to sample in the morning after the fog burns off. Sometimes we take a sample from every two or three acres. If there is more uniformity in the vineyard, we might only sample from every 30-40 acres. We have five people sampling; myself, our viticulturist, and three of our ranch managers and sometimes the winemaker.

We can relate the results to the vineyard because we are out there taking the samples. The winemaker can't get to every vineyard but we meet daily in the afternoon to discuss sample results and vineyard conditions. If we think there will be a problem in a particular vineyard reaching certain sugar levels, we'll inspect that vineyard together. For example, in '79 and '83 when it got really hot and the soil moisture in some vineyards was pretty well depleted, sugar production actually stopped. You're better off picking Cabernet Sauvignon at 21° Brix in those conditions than waiting for 23° Brix while the acids and pH go crazy.

But even if the numbers are what you want and the fruit looks good, you still can't be sure what type of wine you'll get. Take Cabernet Sauvignon for example. We can get the same numbers from three different vineyards in the Napa Valley, pick them each at the same time and get three completely different wines. Our reserve Cabernet is made with grapes from our Lemon Ranch in St. Helena. It is our biggest, most complex wine, needs the most time to mature and has a minty, chocolatey character. The 1983 numbers were 22.2° Brix, 0.65 TA and 3.4 pH with 2,500-2,600 ppm tannin. Tannin is measured by total phenols colorimetrically using folin-ciocalteu as an indicator. (Singleton & Ross, *AJEV*, Vol. 16-144- 158, 1965) The vines only yield 1½ tons/acre but I don't think they are capable of anymore.

Cabernet grapes from our State Lane Ranch in Yountville came in at an average of 23.9° Brix, 0.8 TA and 3.3 pH with 2,200 ppm tannin in 1983. This 15 acre vineyard is on a poorly-drained clay soil, only yields 3 tons/acre, and produces wines that have softer tannins. This wine does not need as much ageing as the Lemon Ranch Cabernet and has a berry character that dominates a mintiness that is also noticeable. Vines at our Knight's Valley Ranch are on a gravelly, rocky, well-drained soil with a western exposure, which consistently yield 3 tons/acre and produce wines that have more of the berry (cherry or currant) flavor than the State Lane wines. Last year the fruit came in at 22.2-22.5° Brix, 0.73-0.78 TA and 3.3 pH with 2,200 ppm tannin.

Obviously, the numbers are only a guide. You have to know the individual vineyards, the characteristics of the fruit and what they are capable of producing in a given season.

Bright Wines, Canada

PW: Is determination of grape maturity a different sort of problem in Canada than in California?

George Hostetter (Director of Research): Very much so. In Canada — especially here in Ontario's Niagara Peninsula — we are in a fringe grape-growing area. As such, our problems differ tremendously from those encountered in California. While Californians work with the great 'cool climate grapes' in warmer areas than where the grapes have traditionally excelled, we work in regions much colder.

While the problem in California can often be to maintain delicacy and finesse, here the problem is sometimes to attain even reasonable maturity. This explains, of course, why the recent trend in California toward earlier harvesting of some varieties — which I saw as imperative there — is rarely a consideration north of the border.

PW: What guidelines are you using, then, to determine grape maturity?

GH: The single most important measurement in areas as cool as Canada is unquestionably the sugar level. Ontario is now adopting a system of paying more money for grapes of higher Brix. And, of course, the German grading system of Kabinett, Spatlese, Auslese, etc. has long given credibility to this concept. But this is the case only because high acid levels in cool climates can almost be taken for granted. We monitor the TA, the pH, and even keep an eye on the tartrate/malate ratios, but only in a few varieties in exceptional years will these considerations outweigh concerns about the sugar level.

The French-hybrid Marechal Foch can be tricky this way. In warmer vintages like '83, there was a tendency for the pH readings to start levelling off — usually between about 3.1 and 3.4. This was at a time when there is still potential for further sugar accumulation. Experience has taught us, though, that it's best to harvest at this point. Delaying only permits a physiological breakdown of the grape that involves a softening of the skin's cell walls. Wines made from Foch at this stage are flabby and hazardously unstable in bottle.

The opposite is true of the French-hybrid Baco Noir. A later harvesting, after a certain degree of dehydration and a jump in the pH, can produce excellent wines. Referring to 30 years of harvest data on our individual vineyards has helped us tremendously in making observations of this sort.

Bob Steinhauer

George Hostetter

PW: Do vineyard appearances assist you in determining harvest times?

GH: Definitely. I do look for the green to gold, and opaque to translucent color change in white grapes. I think it's especially important in cool climates because it seems to parallel a marked drop in the TA. But most other obvious vineyard characteristics vary so much between varieties that it's dangerous to generalize. Picking while the berries are still firm to the touch, for example, is imperative with the Foch, as I indicated earlier, but is sometimes too early for the Baco Noir or a host of others.

There is a secondary concern involved here as well: the grapes can't be left so late that they overstress the vines. With Canada's cold winters there is too great a chance of damaging the vines permanently by reducing their protective starch level. And, also, by not allowing sufficient suberin to build-up outside the cambium layer, late-harvesting leaves vines susceptible to dehydration, particularly the tender viniferas. For this reason some vineyards shouldn't be late-harvested two years in a row.

Buena Vista Winery, CA

PW: How do you determine grape maturity?

Jill Davis: We're in the cool Carneros region, which has a

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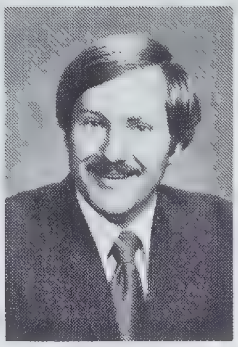


Dwayne Helmuth

Greg Loeffler

Paul Dolan

Jim Gifford

Steve MacRostie

David Heitz

Michael Martini

long growing season and we reach what I call grape maturity at lower sugar levels than most people aim at. I'm speaking of physiological grape maturity where the berries soften, the skin turns translucent and the flavor is there. This occurs at much lower sugar levels here than in upper Napa or Sonoma valleys.

With Gewurztraminer, I watch the color. Some people think that you need color in the berries to make good wine. But I can take fruit with less color and get the good color and flavor in the wine by using up to 18 hours skin contact time. Gewurztraminer is known to drop its acid quickly during ripening but we can get around that here by picking at 21° Brix. The acids are good and that spicy flavor is there. If that flavor wasn't there I would wait for it to develop. Flavor is the most important criterion for maturity with Gewurztraminer. As far as numbers go we generally get 0.8-0.9 TA and 3.3-3.4 pH when our grape is mature.

I really shock people with Chardonnay because my target for sugar is 21.5° Brix. I get good fruit flavor then. The berries are soft and the skins are translucent. We look for 0.85 TA and 3.2 pH at this maturity level. Even though all our Chardonnay is grown in Carneros, it ripens over a two-week period due to different vineyard locations and age of the vines. In areas where the flavors are slow to develop you can see the change in the berries even though the sugars stay the same.

We make a limited amount of a fuller style Chardonnay that is more viscous in the mouth and that fruit usually comes in at 22- 22.5° Brix. But our main style is a lighter fruity wine that tastes like the Chardonnay fruit. We have kept wines from our different Chardonnay blocks separate in 1983 so we could see what characteristics these blocks had. It was the first crop from the block right in front of the winery and it was obviously very fruity. Some of the other blocks were quite herbaceous.

For Zinfandel, we are looking for 22.5° Brix, 0.8-0.85 TA and 3.2 pH. The peppery flavor that I expect in this variety peaked at the end of October last year and the sugar was at 22.4° Brix.

We make three different wines from Pinot Noir grapes, so we are looking for three different maturity levels. Pinot Jolie has the least alcohol and is picked at 19.6° Brix, 1.1 TA and 3.0 pH. The grapes had color but they were not fully black. What I wanted was to get the most fruit flavor with the least color. Because there wasn't much color in the berries, I was able to ferment on skins for two days, get lots of berry flavor and still get light color.

We picked at 21° Brix, 0.9-0.95 TA and 3.2 pH for our Pinot Noir Rose. The berries had so much color at this stage that I could only leave the juice on the skins for 18 hours. I could not ferment on the skins and I still had to fine with bentonite to reduce the color. For our standard Pinot Noir, we aim at 22.5° Brix, 0.85 TA and 3.3 pH. I was looking for a peppery flavor, almost like the Zinfandel flavor, so we picked on taste for this wine. We don't have any trouble with getting color in Carneros. Probably because our yields are so low (1 1/2 tons/acre) the berries are small with intense color and flavor. They came in quite late in 1983 — the first week in October.

For Cabernet Sauvignon, we aim at 22-23° Brix, 0.8-0.85 TA and 3.3-3.4 pH. We don't get a lot of herbaceous character here. We do get intense flavor, but it's intense berry which over-rides a slight herbaceousness. This is not the green-bean type, it's the olive or bell-pepper herbaceousness. When I chew Cabernet berries, I'm looking for the berry fruit characteristic to dominate the bitterness and astringency of the tannins. Earlier on, the berries have a strong herbaceous flavor but are also quite astringent and unpleasant to taste.

Callaway Vineyards, CA

PW: How do you determine grape maturity?

Dwayne Helmuth: We start taking grape (individual berry) samples at around 12-13° Brix and also run TA and pH in every vineyard we intend to purchase grapes from. We continue sampling twice a week until the vineyard approaches a level within about 3° Brix for our desired pre-harvest sugar level, and then sample every other day constantly monitoring pH, TA and making a sensory evaluation as well.

When we see a marked decrease in TA, a rise in pH and a somewhat slowed increase of the Brix, we feel the grapes have at least numerically reached their optimum and harvest begins on that vineyard. If the first loads crushed confirm our sampling and the sensory evaluation of the juice is as expected, we continue to harvest.

Our harvest targets are: Chardonnay, 22.6-24.0° Brix, 0.7-0.84 TA and 3.2-3.5 pH; Chenin Blanc, 21.0-22.5° Brix, 0.68-0.82 TA, 3.2- 3.5 pH; Sauvignon Blanc, 22.5-23.8° Brix, 0.7-0.85 TA, 3.2-3.5 pH; and Riesling, 20.0-22.0° Brix, 0.7-0.85, 3.1-3.4 pH.

Our actual figures in 1982 were lower in sugar in relation to the desired levels but the crop level was heavier. 1983 ?were very close to target, but with the seasonal rains we experienced, pH and total acid were slightly higher and lower respectively than desired.

We are in region III, according to the Davis degree-day summary, and typically the harvest begins just after Labor Day. We generally have overnight lows in the 50's and 60's with highs in the 80's and 90's. Seasonal rains can spring up from tropical storms off Mexico, but generally northern rains do not get this far south until November and after our harvest. We feel our weather, if typical, is ideal for harvest since it allows us some flexibility as the grape maturity level becomes predictable days ahead of actual harvesting.

Our grape yields average 4½ tons/acre from Chardonnay, 3½ tons/acre from White Riesling, 6½ tons/acre from Chenin Blanc, and 5 tons/acre from Sauvignon Blanc.

PW: Have you noticed particular vineyard conditions that contribute to certain varietal characteristics?

DH: We have noticed for instance with Sauvignon Blanc that gravelly soils give us more grapefruit and grassiness where as the more decomposed granite soils give a bit more of the subtle herbaceousness and vegetative character associated with Sauvignon Blanc. With Chardonnay, we have seen that the same clone (U.C. Davis Clone #5) grown in very near proximity to other vineyards give more intense varietal character than would be expected.

We have only just begun to track these vineyards i?ars and more history is needed to make more specific determination of conditions versus varietal characteristics. We do feel that our ability to grow grapes on their own vinifera roots enhances the true varietal characteristics of the grapes in this region.

PW: What factors do you think emphasize varietal characteristics or aromas in the vineyard?

DH: We have gone exclusively to the quadralateral cordon or geneva double curtain in all our own vineyards. This was recommended by Amand Kasimatis at U.C. Davis because of the pH related question. We feel that by opening up the canopy and exposing more of the vine to direct sunlight we not only improve the quality of the fruit but also influence the potassium uptake of the vine and that helps keep the pH of the mature fruit down a tenth or two (i.e. 3.3 or 3.4).

We have only two years of data on the Geneva Double Curtain. We have seen only a subtle increase in the intensity of varietal grape flavors and we firmly believe that a minimum of three to five years experience is necessary to accurately say that the trellis system is responsible. I do feel, however, that since the pH has slowly gone down a tenth or more in the last two years that it may be a result of the trellising system and the more exposed canopy.

We also know that crop level, irrigation, and pest damage are still very serious conditions that if allowed, will certainly lessen the varietal intensity—you can't expect a stressed, over-cropped or diseased vine to fully mature the fruit to its full potential.

Chateau Ste. Michelle Vintners, WA

PW: What are your maturity standards?

Greg Loeffler (Grower Relations Viticulturist): A minimum of 18° Brix for Pinot Noir to be used in sparkling wine, 20° Brix for Gewurztraminer, 21° Brix for Riesling, Chenin Blanc, Semillon and Grenache, and 22° Brix for Sauvignon Blanc, Chardonnay, Muscat Canelli, 23° Brix for Merlot and Cabernet Sauvignon. Penalties are imposed on fruit to 2° Brix under these levels. Below that, we have the option to reject.

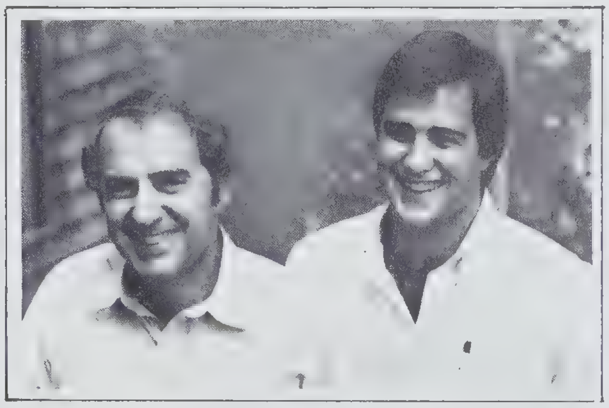
Flavor is also an important maturity parameter, so I taste the fruit at each sampling. For example, I'm looking for a muscaty, honey-spicy character in Riesling when the fruit is translucent and speckled in appearance. It is usually 20-22° Brix, 0.8-1.1 TA and 2.9-3.2 pH at this time.

PW: Do you impose any acid threshold?

GL: No we don't, per se, as the sugar-acid ratio is generally well-balanced. If anything, a ceiling would be more appropriate than a floor for acid. pH's are likewise favorable (i.e. low), contributing to the crispness and liveliness often found in northwest wines.

PW: When are the grapes harvested?

GL: The vintage starts off with Gewurztraminer and Pinot Noir from mid to late September and progresses into October with Semillon (10/1 - 10/15), Sauvignon Blanc (10/5 - 10/20),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Chardonnay, Merlot and Grenache (10/10 - 10/25), and finishes in early November with Cabernet Sauvignon and Riesling (10/10 - 11/1) and Chenin Blanc (10/15 - 11/5).

PW: Could you describe the climate during the maturation period?

GL: Eastern Washington's vineyards generally fall into regions I and II. The temperature reaches a high of 100°F for 2-3 days during the summer. The average July/August high is 90°F and the low is 55°F. Veraison is usually mid-August so maturation is from then onwards. There is a definite break between summer and autumn regimes right around Labor Day.

At that time, day and night temperatures quite suddenly drop by 10-15°F, effectively slowing down maturation. Even Gewurztraminer, whose acids drop notoriously fast, level off, allowing harvest to proceed more leisurely. The Cascade Mountains shelter us from any significant rain until late October.

PW: What is the delivery mode?

GL: The majority of grapes are still hand-picked into cherry bins which hold about 400 lbs. However, mechanical harvesting is becoming more widely accepted as we are experiencing good results with it. More and more vineyards in the area are being trellised for the pivotal pulsator. This means metal stakes at every vine and either a three-wire vertical or some form of narrow 'T' trellis. Wineries are also setting up for receiving the larger containers which come with mechanical harvesting.

PW: Washington is becoming known for its whites—Riesling in particular. What is it about your growing conditions that account for this?

GL: White Riesling is the mainstay of the region's line of wines. With very little trouble, the grape is grown, the wine is made and the consumer glad of it. It simply cannot be denied. The affinity between climate, soil of volcanic origin and the grape is a natural. Without belaboring the obvious, we are located at 46°N—the same latitude as the prime northern European grape belt. This confers upon us long summer days, charging the vines' photosynthetic batteries to a high state.

Being inland as we are, more or less bracing winters are the rule. Riesling characteristically shrugs these off with relative impunity. As said previously, this is among the last varieties to ripen, but has a striking ability to harden its wood simultaneously.

PW: What do you do to encourage winter hardiness?

GL: You might say all of our cultural practices pivot around this crucial point. Fortunately, everything we do in this regard also promotes optimum grape quality. This covers pruning and thinning to keep the crop level down, moderate use of fertilizer and irrigation to control vigor, planting on slopes with well-drained soils to prolong the growing season.

We're learning more about how to best deal with this restriction, turning a handicap into an attribute. Young vines are more susceptible to winter damage, and extra care is needed in their management. For instance, an annual cover crop is sowed in mid-summer so as to compete with the vines for moisture and nitrogen. This helps prevent production of green wood that won't mature.

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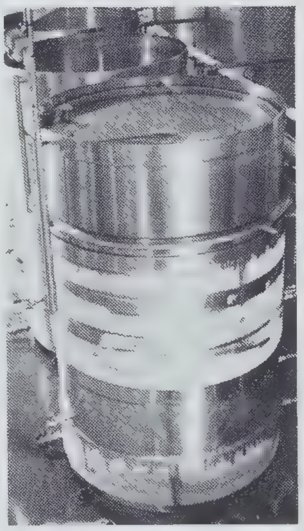

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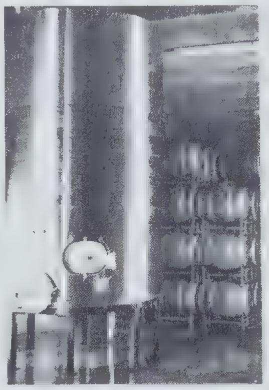

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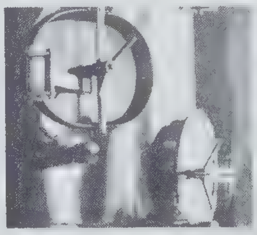

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PW: How old are the vineyards?

GL: A very small number of plots remain from the 1940's, but the varieties are of the common ilk. Premium viniferas have been grown and appreciated to any degree only in the last 15 years. Andre Tschelitscheff has been very influential and supportive in the rise of Washington as a wine-producing region. Walter Clore has been another key figure, in his capacity with Washington State University and now as a private consultant.

Of the 9,000 acres of vinifera, 7,000 have been planted since 1977. 75% consist of whites, with Riesling in first place and Chardonnay in second. The reds are attracting greater attention as vineyards, viticulturists and enologists grow older.

PW: What is your policy concerning grape defects?

GL: The occassional botrytis, such as occurred in 1982 is usually noble. If not noble, either it drys on the vine before harvest or requires selective picking (and incidentally, a botrytised cluster is not detached fairly readily by the striker or pulsator). Powdery mildew is really the only other disease with which we have trouble. Most contracts stipulate a 3-5% tolerance level.

Its notable that many vineyards did not find it necessary to spray for any pests or diseases until recently. The necessity for treatment coincided with the increased density of vineyards. Concords, of which there have been plenty, are host to a largely different spectrum. By most world standards, we are relatively free of parasitic organisms.

Washington has escaped the scourge of phylloxera so far, and virtually all vines are on their own roots. Our sandy soil undoubtedly is a major factor here, but nematodes haven't been much of a problem either. Stringent preventive measures are taken to keep it that way, although they may eventually take a foothold. A strong research and IPM program also serves to monitor and contain any threats.

Fetzer Vineyards, CA

PW: How do you determine grape maturity?

Paul Dolan: I look at sugar, the time of year, condition, acid, pH and flavor of the grapes. In most cases, sugar is the main criterion as it affects the style of wine I make. There are times, like in rainy periods, that we can't get the sugar levels we want. The grapes could sit out there for a week or more and not increase in sugar level.

Meanwhile, the acids and pH's are deteriorating, so you have to pick before you normally would. Generally speaking, I like to get 20-21.5° Brix for white varieties because this produces wines of 12-12.5% alcohol. This enhances the varietal character and fruitiness that I want in the wines.

Of course, there are exceptions to this. For example, Gewurztraminer in the cooler Anderson Valley area may not have enough maturity and color at that point. I may leave it on the vine a little longer to develop the necessary characteristics. In most years by the time it reaches 21° Brix, it has a clean, Alsation-type spiciness. Fruit from the warmer Ukiah Valley region is not as fresh and has a heavier fruit characteristic at the same sugar level.

The Anderson Valley vineyard is on a hillside with relatively thin soil. The vines are smaller than those at Ukiah. They are at a closer spacing, 6 X 10 or sometimes even 5 X 10. Both the berries and clusters are smaller on these vines as well. Vines in both vineyards are spur-pruned to 24 buds on bilateral cordons. We get four tons/acre at Ukiah Valley and 2 1/2 tons/acre at Anderson Valley.

Flavor is important in determining maturity for Sauvignon Blanc. Most of ours is here at Redwood Valley or down at Hopland. Redwood Valley fruit tends to be more austere and doesn't have a lot of varietal intensity. At Hopland, the vines are larger because they're on deep rich river soil and the fruit has that typical grassy varietal character. We don't get that

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character at Redwood Valley where the vines are on thinner, gravelly soils.

Usually, if you pick Sauvignon Blanc early at 21-21.5° Brix, the varietal character is at it's peak. But in 1983 it rained during the ripening period and we had to pick at about 21° Brix. The wine is clean and crisp with good fruit but the grassy varietal character seems to have been diluted by the rain and there is less than 12% alcohol. We had a typical ripening period in '82 and the fruit came in at about 22° Brix. These wines have a lot of varietal character but are also a little high in alcohol at 13%.

Our Chardonnay from Hopland is usually ready to pick about September 10. This is about three weeks before any Chardonnay is ready in Redwood Valley. Everything seems to come along quicker in Hopland because both days and nights are warmer. We're definitely looking for a color change in this variety. We look for that golden color that starts developing at about 19° Brix.

This is particularly true for exposed fruit because you can get nice ripe berries that are still green if they are up under the canopy. In fact, I believe that you get more varietal character from these green berries than from the golden ones. That golden color can indicate that the berries have matured too quickly because the sun has been on them.

The varietal character I'm after in Chardonnay is a ripe, appley one. The golden berries tend to be more melon or peach-like. Fruit compostion from our Sundial Ranch at Hopland is 0.9 TA, 2.9-3.0 pH and 22° Brix, but it ripens so early it never seems to develop the depth of flavor that we like. It is a little tart with a crisp, clean, appley-lemon character.

In Redwood Valley, where the fruit ripens slower, it has more varietal character and depth of flavor. At Anderson Valley, where the maturity season is even longer, the fruit develops a crisp apple flavor. Sometimes it goes to the ripe apple-cinnamon flavor that I consider ideal for Chardonnay.

1983 was the first time we crushed fruit from Ukiah Valley and we noticed a cinnamon-nutmeg spiciness balanced with a vegetative character. This is probably because the vines are on heavier soils and are more vegetative than those at Redwood Valley and Anderson Valley. These vines are on an 8 X 10 to 8 X 12 spacing and yield five tons/acre.

Zinfandel is a difficult variety to pick because it ripens so unevenly. You'd like to get it when most of the berries have gone from red to blue. But while you're waiting for those last red berries to turn blue, the blue berries are shrivelling. So you have to visit your Zinfandel vineyards at least 3-4 times/week.

We have this variety in ten different locations so it's difficult to catch it at the right time in each one. Our vineyard designation Zinfandel comes from three areas: Lolonis, at Redwood Valley; Richetti, 50 feet higher than Lolonis and Scharffenberger at Talmage. These are all hillside, dryland vineyards. The vines are pruned to 24 buds with 12 spurs on each of the head-trained vines and yield 3½-4 tons/acre.

Richetti is at 1,100 feet on a red clay soil with a mainly northern exposure. This fruit generally comes in at 24° Brix, 0.8 TA and 3.5-3.6 pH and has a deep earthy spiciness with some berry tones.

Lolonis fruit usually comes in at about 23-24° Brix, 0.75-0.8 TA and 3.3 pH and has more of a fresh berry character than the Richetti fruit. Both vineyards are on similar soils, but

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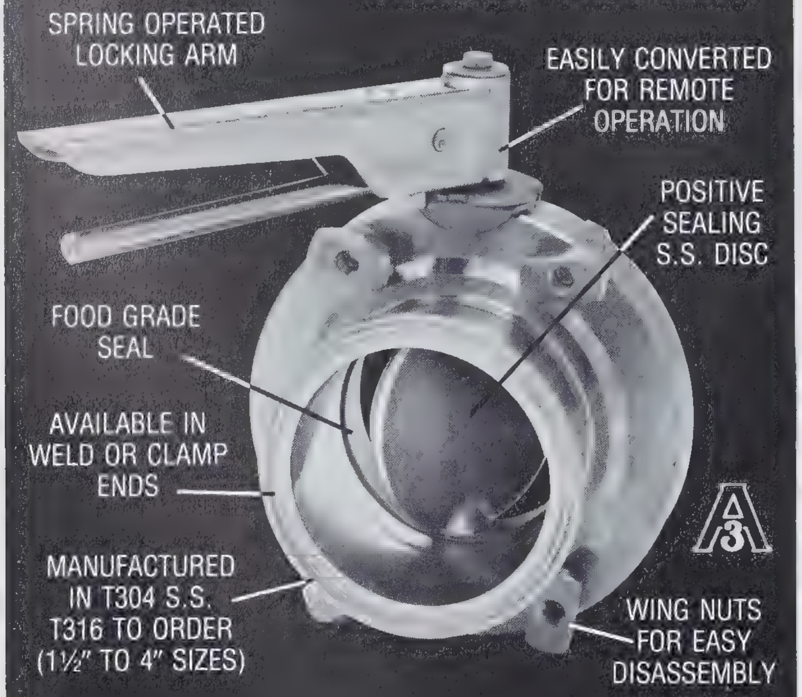
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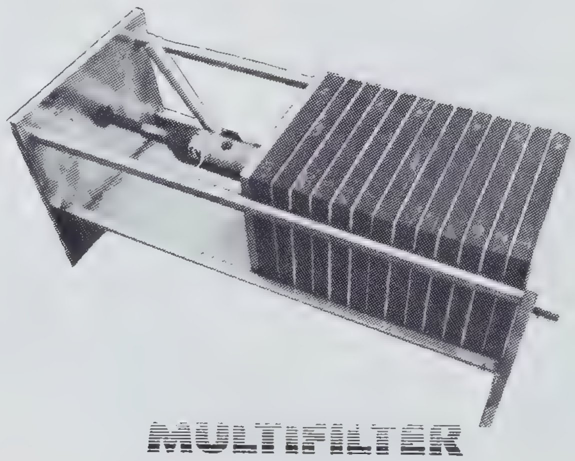

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Lolonis has a southwest exposure and the vines are on an 8 X 10 spacing and only give 3½ tons/acre.

Scharffenberger fruit has more of a blackberry and spicy character than Lolonis fruit but the composition is nearly the same at 23-24° Brix, 0.75-0.8 TA and 3.2-3.3 pH. These vines are also on an 8 X 10 spacing, pruned to 24 buds on bilateral cordons and yield four tons/acre. They are on alluvial soil which varies from soft chalk with some sand to red clay and have a southwest exposure. Fruit from each of these three vineyards is picked from mid to late September.

We also have Petite Sirah at Lolonis and Scharffenberger and spacing, pruning and yields are essentially the same as the Zinfandel. Picking at Lolonis is generally just before or just after the Zinfandel with fruit composition at 24-24.5° Brix, 0.75-0.8 TA and 3.2 pH. Scharffenberger fruit isn't picked until early October and comes in at 24-24.5° Brix, 0.7-0.75 TA and 3.4 pH. Fruit from both vineyards has a black pepper spiciness with some chocolate tones.

We grow Riesling on the Ukiah Valley floor and at our Mountain Valley Ranch which is near Boonville. These vines are on deep alluvial soil with some clay so it's necessary to use a closer spacing (8 X 10) and grow a cover crop to help contain their vigor. They yield 5-6 tons/acre and the fruit is generally 21° Brix, 0.8-0.85 TA and 3.0-3.1 pH at harvest in the first week of October.

Vines on the valley floor give us 5-6 tons/acre and are close to the Russian River on a sandy soil. So we have to give them drip irrigation in late June and in mid-July. They are on an 8 X 12 spacing and fruit composition at harvest is usually 21-21.5° Brix, 0.8-0.85 TA and 3.2 pH. Picking here is also in the first week of October.

These are just general impressions of Mendocino fruit. So many factors in combination influence fruit composition that it's misleading to suggest that particular ones cause measurable differences in fruit quality.

Gold Seal Vineyards, NY

PW: How do you determine grape maturity?

Jim Gifford: The two main things I look at are climate and Brix. We have cold winters and hot summers with cool nights, giving us a short ripening season of about 170 days. Sugar levels increase rapidly, sometimes 3° Brix/week, so I don't get the luxury of being able to visit every vineyard to look at, feel and taste the fruit before deciding when to pick. My main concern is fruit appearance. I'm always trying to get clean fruit, free from Botrytis, except for our late-picked Riesling styles. It's pretty wet here in New York and Botrytis usually comes in just when the fruit is softening at veraison. This means we're picking most varieties at about 16-18° Brix.

We're in what I call a low region II here at the middle of Lake Seneca. Geneva, at the north end is a high region I. We've been keeping temperature records since the 1960's when many vinifera varieties were being tested for suitability to this region. Chardonnay, Gewurztraminer and Johannisberg Riesling were the only ones that would succeed here and are the only varietals we make. Most of our production is hybrids (American species X *vitis vinifera*) and is used for cuvee stock and blending. We also grow a lot of Concord for red wine production.

Every year I check the Chardonnay vineyard and have found that there is one place that generally gives clean fruit at 20-23° Brix. In the rest of the vineyard Botrytis has been more of a problem, coming in when the fruit is about 17-18° Brix. So we pick here before this happens and use the fruit for Blanc de Blanc. For the last four years I've been able to get some Chardonnay to 23° Brix with at least 0.8 TA and 3.3-3.4 pH. This gave a full-bodied, California-style wine which is often confused with one Napa Valley Chardonnay in blind tastings. 1981 was an exception. That year was cloudy and wet. The acids stayed high and the pH went up. It was 3.6 before fermentation, about 3.7 afterwards and the wines had an olivey-grassy character that we don't usually get.

I don't use malolactic fermentation because we're in an old winery that was used for flor Sherry production and I don't want to chance contaminating the wine. So in 1981 I had to de-acidify because the fruit came in with a TA of 1.0. That was the highest acid level I've seen in Chardonnay. It usually comes in from 0.8- 0.9.

There is quite a range in fruit appearance for our Rieslings. For the dry, Qualitatswein-style, I pick at 17-19° Brix, 1.1-1.2 TA and 3.2 pH. Since Botrytis can appear when the fruit is at 16° Brix, we have to go into the vineyard to make sure the pickers take only clean fruit. In good years, when there's no Botrytis, we get an intense, lemony, fruity flavor. But most years there is some Botrytis and we get more of an earthy, full-flavored, Rhinegau-type wine. To give you an idea how fast the fruit ripens, over the three-week picking period the sugar ranges from 16-22° Brix. So our average is about 20° Brix for Riesling. I only want about 10% alcohol in this wine and we're working with a 58% conversion ratio so I always make sure I have 20° Brix (some years I have to chap-

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talize to get it.) This leaves 10.2-10.4% alcohol after I ferment down to 1.0-1.2% sugar.

For our late-picked spatlese-style we pick fruit with up to 50% Botrytis. For the bunch-selected, Beerenauslese-style, we have to go into the vineyard and make sure the pickers take only completely rotten clusters, generally with lots of fungus. These usually have a rich, sweet smell, so there's no doubt that it's the noble rot. We only average about 3/4 ton/acre on the bunch-selected Riesling compared to 3-3½ tons/acre on our other Riesling. So you can see that we're pretty strict with this bunch selection. Our juice yield at 28° Brix is 140 gallons/ton using a bladder press so we obviously don't have a high percentage of shrivelled fruit.

We picked Gewurztraminer at 20.5° Brix in '80 with 0.65 TA and 3.5 pH. So in '83 I knew I'd have to pick on pH and acid and then chaptalize. I got 3.4 pH and 0.68 TA with 18° Brix. So I chaptalized to 20° Brix, gave it some skin contact to add depth and the wine has a nice, spicy, fruity character.

We want good acid, clean fruit and minimum flavor from our hybrids so we concentrate on picking them early (16-17° Brix). Early picking is especially important for Aurora as this variety ripens early when the weather is hot and the breaks down quickly after it matures. Even though the unpleasant, medicinal character of this variety increases with maturity, it is still so pronounced at 16-17° Brix that we have to tone it down by ameliorating the wine with water and liquid fructose.

We also have to tone down the fruit character of Seyval, Vidal and Ravat by picking them early (16-18° Brix) because they are used for 50% of our Blanc de Blanc production. We also ferment them at higher temperatures to help get rid of volatile, wild aromas. Both Seyval and Vidal have a Chardonnay, appley, fruity character at 16-18° Brix, but become more Chenin Blanc and honey-like and wild in flavor if they get any riper. Acids and pH are usually 1.3-1.4, 3.1-3.2 and 1.5-1.6, 3.1-3.2 respectively at these sugar levels.

Catawba is our biggest seller for table wine, but we also use it in the Henri Marchant Champagne. For this we pick it at 14-15° Brix. The fruit becomes Gewurztraminer-like pink at 17-18° Brix and produces orange wine. So we try to pick it at 16° Brix for table wine production. Acid is usually 1.8 and pH 2.9-3.0 at this sugar level.

Our viticultural system is called survival. We keep the viniferas small (about 2½-3 feet from the ground) so the radiation from the soil will help protect them from the cold. Vines with long trunks are more susceptible to winter kill. Labruscas and hybrids are much more resistant so we can put them up on a Geneva Double Curtain for better fruit exposure and yields. Our vineyard manager learned viticulture from his father who had been growing labruscas and (labrusca X vinifera) hybrids all his life. He learned that Duchess and other hybrids with vinifera parents need a special growing system. The system is to train the vines to three trunks varying in age from one to five years. In this way when at least one trunk is killed in a severe winter, there will be at least one left to give a fruiting vine.

We don't have a system of leaving a given number of buds/vine at pruning because we never know how many or which ones we will lose during the winter. So we have to prune twice. First it's just to thin the vines out. Then in the spring, at budswell, we can do a count and decide how many buds to leave. So pruning is very intensive and expensive.

But we saw the advantage of this system in the spring of 1981 after the 1980 Christmas Eve massacre. On December 23, 1980 it was 45° F, warm enough for the sap to start moving. The next day the temperature dropped to -15°F and we all thought our vines were dead. During spring pruning we found many good buds and were able to prune for crop, not just for vine revival. We ended up with slightly more yield for Riesling and Chardonnay that year than we had in 1980.

Fortunately we have about the best site in the area. It's on the east side and about halfway down Lake Seneca. This is it's deepest part so we get good heat storage. We also get good air drainage from the slope and with our western exposure, the ground warms up all afternoon giving us good heat radiation overnight. We believe that proper scion (budwood) clone and rootstock selection are the most important considerations in determining fruit quality and vine survival. For example, we have a heat treated Chardonnay clone from Dr. Vuitennet at Colmar on the moderate vigor 3309 rootstock. This gives us about 2½-3 tons/acre. If there is too much vigor the vines will be killed by the cold winters. Too little vigor and they can't mature a crop.

Growing vines in the Finger Lakes of New York is a real challenge, but that's only half the problem. Winemaking with hybrids and labruscas present special problems of slip-skin, high-pectin fruit and that's another challenge. Fortunately, I enjoyed it.

Hacienda Wine Cellars, CA

PW: How do you determine grape maturity?

Steve MacRostie: I look for a balance in the fruit. A com-

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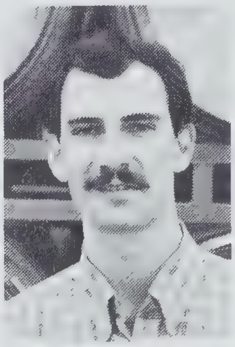

Dave Ramey

bination of sugar, acid, pH and flavor that will give the right balance in the wine. Sauvignon Blanc is a good example. There is a grassy character that seems to peak at around 20-21° Brix and diminish at around 23-24° Brix. I've noticed that exposed fruit with a golden tinge has less of this grassiness than greener fruit. There is also a floral character that develops in fruit from some vineyards and not others.

PW: Can you describe the changes in fruit intensity during ripening?

Bill Rebich: It got pretty hot towards the end of ripening in Sauvignon Blanc in 1983 and our daily sampling showed that the berries were softening and the sugar and flavor were increasing rapidly. On September 3 we had 19.8° Brix, about 1.0 TA, but not enough fruit intensity. By September 8 we had 20.5° Brix but still not enough fruit. Then it got hot and by the 14th we had 22.2° Brix, 0.82 TA, 3.4 pH and a lot of fruit intensity.

PW: Have you noticed differences in varietal characteristics with fruit of the same maturity from different areas?

SM: Gewurztraminer is a good example. We've taken grapes from two places for a number of years. Red Winery Ranch in eastern Alexander Valley and Ranch Alto Vista in Sonoma Valley.

The Alexander Valley vines are irrigated, on deep soil and yield five tons/acre. This fruit always has an intense, spicy flavor. The Alta Vista Vineyard is on a hillside 1,000 feet above the valley floor and also above the fog's cooling influence. These vines only yield about 2½ tons/acre. They are not irrigated, have smaller canopies than the Alexander Valley vines and the fruit never develops the same intensity of flavor. There seems to be something about that Red Winery Road area of Alexander Valley that gives a combination of high yields and intense fruit character.

With Chardonnay we are looking for sugars from 22.5-24° Brix. This is for flexibility because we would really like it all at 22.5-23° if the flavors are there. We obviously can't get it all at that sugar level. This allows us to take the fruit at the right chemical balance (0.9-1.0 TA and about 3.2 pH) and still give the grower optimum payment instead of encouraging him to wait for 23.5-24° Brix while the acids and pH deteriorate.

PW: Have you noticed a range of fruit intensities at different sugar levels as with the Sauvignon Blanc?

SM: You tend to get an appley, citrus, banana character at 21-22° Brix. While at 24° Brix, the intensity is still there but there is a difference in character that I can't really describe. My impression of the southern Sonoma wines is that they are more closed in and take longer to come around than those from the eastern bench of the Alexander Valley (Red Winery Road). We've been getting Chardonnay from a couple of different places in the Sonoma Valley for a numery Road). We've been getting Chardonnay from a couple of different places in the Sonoma Valley for a number of years and the fruit from each is definitely different.

The Hunter Ranch has a heavy soil, bottomland situation and wines from this fruit are medium in expansiveness. Our estate Chardonnay is mainly from vines around 20-years-old which are dry-farmed. Yields are low and the vines show moderate vegetative growth. This is an old clone on rocky, well-drained soil, and produces the richest wine we have found from this area.

Our Cabernet Sauvignon is in pretty cool parts of the Sonoma Valley, and we're lucky to reach 23° Brix in any year. So we're mainly concerned with achieving a good balance of sugar, acid and pH. Fruit from the Jansen Vineyard in Glen Ellen has a particularly minty character. We don't know the reason for this but we have noticed a variation in this mintiness from year to year.

BR: It could be due to differences in fruit ripeness. In '81 the fruit got riper and the mintiness came through. But in '82 and '83, the fruit wasn't as ripe and there was less mintiness.

SM: That's possible because in '81 we got 23° Brix, and in '82 and '83 we didn't even get 22° Brix.

Heitz Wine Cellars, CA

PW: How do you determine grape maturity?

David Heitz: We pick on sugar mainly but also take berry firmness into consideration. All the grapes we buy come from the Napa Valley between Napa and St. Helena.

We are aiming at a full-bodied, soft-style of Cabernet Sauvignon. We get our fruit from the Oakville-St. Helena region where it generally reaches 23-24° Brix and has a rich and full-bodied varietal fruit character that we like. Even though the fruit in both Bella Oaks and Martha's Vineyard mature in mid-October and is picked at approximately the same sugar levels, there is a difference between the two wines which I can't explain. The growing conditions are essentially the same but the fruit from Martha's Vineyard is always slightly lower in acid than the Bella Oaks at the same sugars.

We are aiming at a round soft-styled Pinot Noir and prefer fruit from the Napa-Yountville area to that from Carneros. I would like to see 23° Brix and 0.8 TA when the berries are in good condition for picking.

Chardonnay from the St. Helena area at 22.5-23.5° Brix gives us a rich full-bodied wine that we like. Grapes picked at lower sugar levels tend to be hard, austere and lacking in richness.

We pick our Grignolino at 22-23° Brix usually in the first or second week in September, from which we make both a red and a Rosé.

Louis M. Martini Winery, CA

PW: How do you determine grape maturity?

Michael Martini: I usually look at the condition of the vineyard situation to see if the crop is at its peak. Then I check color and taste of the fruit and run the sugars. Sugar is very important as it determines the wine style you get. In the white varieties I look for a yellowing and translucent appearance of the skin combined with specific flavors expected from each variety. In the red varieties there is a point at which the fruit really begins to darken and the taste changes from predominantly bitter tannin to berry fruit.

I'll mention each of these varieties separately so the differences due to clone, vine age and vineyard location will be apparent.

Our only source of Johannisberg Riesling is our Mayacamas mountain-top Monte Rosso Vineyard where the variety always ripens well. The fruit softens and the skins turn yellow and become translucent when the sugars are at 21.5° Brix. The acids are always 0.8-0.9 and pH's 3.2-3.3. Sugar is very important with this variety. I'm interested in a good fruit-acid balance and don't want too much alcohol. So my picking decision is based on sugar readings and grape taste. I can taste the balance of the wine in the grapes.

Gewurztraminer is a little trickier because we have it on three different ranches. Our primary source is Los Vinedos del Rio. This vineyard is on heavy sandy loam soil just south of Healdsburg and I rely mainly on flavor from these grapes. There seem to be two clones there. One goes to a strong yellow translucence and has more of a lychee nut spiciness. The other goes to a deep pink or almost red color.

Los Vinedos del Rio is part hillside and part bottomland with characteristic ripening patterns. The hillside vines are comparatively small, become stressed at ripening and produce small berries. The berries tend to be dehydrating by the time we pick them but have an intense spicy flavor. This spiciness increases with ripeness but because the acids fall away so quickly with this variety, I always get the fruit in before it passes 22.5° Brix.

1982 and 1983 were exceptions as we picked at about 19.5° Brix because the vines just shut down at that level. But we made exactly the same style of wine we usually make when we pick at 22.5° Brix. Usually, 19.5° Brix is too immature and gives a green muscat flavor. I get a very intense spiciness above 22.5° Brix. This is intensified by the correspondingly higher alcohol levels.

In '82 there was such a massive crop on the vines, it never ripened beyond 19° Brix. But they all pinked up and you could see the transition in flavor from green muscat to spice. That very strange condition in '82 led to an exceptional harvest. The vines were green and still pumping at harvest and the crop was 25% above the normal four tons/acre.

Our initial Gewurztraminer vineyard is at Monte Rosso and is a mixture of clones. Elevation is 1,000-1,200 feet, so it's above the fog level, and there is excellent exposure. All the clones have straw-yellow fruit and reach 23.0-23.5° Brix and still hold the acid levels. That's because the vineyard is on Mt. Pisgah, the last mountain before the coast, so it gets cool Bay breezes every afternoon. This fruit also gives a delicacy that we can't get from fruit off vineyards on heavier soils. Gewurtztraminer is the first variety we pick at Monte Rosso (first week of September) but we don't pick La Loma (southern Napa near Carneros) until October.

GEORGE M. SCHOFIELD CO.

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La Loma grapes are mature at 21.5° Brix because it's a cooler region. La Loma vines were planted in 1952, are head-pruned and yield two tons/acre with no irrigation. This fruit contributes the intense cinnamon-spice flavor. It's interesting that the La Loma vineyard always holds a pH of about 3.3 even though the acids may drop to 0.55. This may be due to low potassium levels and/or low nitrogen which are characteristic of this vineyard.

Currently, our main source of Chardonnay is Healdsburg which we planted in 1962. The budwood came from our original clonal vineyard (20 rows) that was planted at La Loma in 1952. These clones were originally picked up from Wente in 1948. They're often referred to as the 'old Martini clones' of Chardonnay. We took three clones to Healdsburg; one has an apple-like flavor but is thinner on the palate than the other which gives more of a muscat sensation. That is it fills the whole palate, almost back to the jawbone. The third clone seems to be a lower-yielding and less vigorous form of the apple-like clone. Another of our ranches, Las Amigas in Carneros, was planted with budwood from Healdsburg but seems to be mainly the appley clone.

I am aiming for good acids (1.0) from Las Amigas for a particular style of wine I'm trying to develop. The style depends on malolactic fermentation and initial sugar levels of 21.5-23° Brix to give the necessary richness. The acids are generally 0.9-1.0 with 3.0-3.1 pH.

At Los Vinedos del Rio, I pick at 22.5-23° Brix with 3.4 pH and 0.65-0.75 TA. This fruit makes more of a rich, California-style Chardonnay while the Las Amigas fruit gives a 'California-Mersault' or sharper style of wine.

We buy Chardonnay from growers in Alexander Valley as well, but due to the heat and the rich soils there, you have to get that fruit early (21.5° Brix, 0.7-0.75 TA and 3.4 pH). The fruit has turned semi-yellow at this stage but gives a rich, California-style wine. It seems that fruit from vines on deep, rich soils generally gives these rich wines. I've picked Chardonnay at Las Amigas at 23° Brix, 0.7 TA and 3.2 pH but can't get the same wine style as I can from fruit at Healdsburg at the same sugar level and 0.7 TA and 3.4 pH.

We get most of our Chenin Blanc from Rigiwin near the Trefethen ranch just north of Napa. I'm aiming for a very light, dry style so I usually pick around 21.5° Brix, 0.7 TA and 3.4-3.5 pH. We get a pumpkin character out of this fruit and the higher pH helps soften the wine. We also get Chenin Blanc from Manley Lane, just south of St. Helena. This fruit generally comes in at 22° Brix, 0.8-0.85 TA and 3.2-3.3 pH and has a nice strong, fresh fruit character. Our Monte Rosso Chenin Blanc comes in at virtually the same numbers and has the same, almost hard fruit character as the Manley Lane fruit. It's too hard for the wine style we make so we have to tone both of these down with wine from the Rigiwin fruit.

All of our Folle Blanche is at Monte Rosso and comes in at 21° Brix, .85-0.9 TA and 3.1-3.2 pH. It has a relatively juicy berry, makes a more austere wine than Chenin Blanc and is very consistent.

Cabernet Sauvignon is our most important red grape variety. We get different maturity levels and fruit characteristics because we grow it at several different locations. We pick Monte Rosso at about the end of September or the first week of October. This fruit usually runs about 23-23.5° Brix and .95 TA. 30-40% of the TA is malic acid so we end up with about 0.75 TA after malolactic.

These are magnificent grapes. The system is stressed (hillside), yield is usually two tons/acre and the berries are small with very dark skins. This fruit gives a real cassis, blackberry-like character which is very easy to distinguish from the green, tart flavor you get before it's ripe. The same budwood went to La Loma as we planted both of these in 1942. But at La Loma, we look for some leaf chlorosis and a little berry abscission before picking. We can't wait any longer than that or we lose the crop in the wind. We generally pick this about the first week of November. La Loma fruit is usually 19.5-21.5° Brix with soft but absolutely black skins. It also gives more depth of palate than the Monte Rosso fruit. Yields are about the same at 1½-2 tons/acre but the TA is 0.65-0.7 with 3.1 pH.

We planted our Chiles Valley vineyard with the same budwood as Monte Rosso and La Loma. We pick this in early November when the fruit is about 22.5° Brix, 0.75 TA and 3.3 pH. This is what I call a Yountville climate with a short hot summer. The vines bud out about April 10. The soils are richer than either Monte Rosso or La Loma and the vines are drip irrigated giving us about five tons/acre.

We've taken fruit from the Cypress Plato Ranch at Pope Valley for a few years now but are still experimenting with picking times and winemaking methods. The first year I picked on pH aiming at 3.1-3.2 but ended up with 3.3 and 21.5° Brix. This wine had a very strange, puckery tannin.

The next year I let it get a little riper, but had to add acid. I picked at 22.5-23° Brix, 0.7 TA and 3.5 pH. I believe the high pH was due to potassium because when I acidified, the pH dropped while not changing the TA. On the slightly heavier soils in this vineyard, fruit had the same pH and sugar but the acid was only 0.55-0.6. It seems that if I pick when the fruit is just changing from that real blue to a darker, almost black, I get the optimum richness and balance. It has a real blackberry, cherry character which isn't present when the berries are still blue.

We get most of our Cabernet Sauvignon from the Carinalli/Hunter Ranch in Alexander Valley. These are big vines on deep rich soils and yield an average of five tons/acre. We start picking this at 22° Brix and finish at about 25° Brix with the pH ranging from 3.2-3.6 and acids from 0.85-0.6. We also get about 180 tons of Cabernet Sauvignon from the Rothlisberger's nearby hillside ranches. This fruit comes in at 23° Brix, 0.85 TA, 3.3 pH and has very pronounced berry character but still retains the same herbaceousness as fruit from the Carinalli/Hunter Ranch.

We have Zinfandel at Monte Rosso and Chiles Valley and

continued p.41

AMERICAN WINE SOCIETY
1967

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Seyval

Eleanor & Raymond R. Heald

Hindsight is usually 20-20. In retrospect, it can be said to be so for winemaking in the eastern United States.

Phylloxera was identified in France in 1868, and the following 20 years witnessed ultimate destruction of European vineyards. In the late 19th century, French hybridizers produced thousands of crosses between native American varieties (exhibiting disease resistance) and vinifera (with proven fruit characteristics and flavors) suitable for wine production. Although the phylloxera problem was solved by grafting vinifera onto American rootstock, work of the French hybridizers laid the foundation of wine grapegrowing in the eastern United States today.

Bertelle Seyve, a hybridizer, married the daughter of hybridizer Victor Villard, in 1919. Seyve attached his wife's maiden name to his, and hybridizing work following his marriage was done under the name Bertelle Seyve-Villard. Seyve-Villard 5-276 (5 representing a 5th generation cross or 64 progenators) was crossed in 1921 and first planted in French vineyards in 1923. It was named Seyval blanc by the French, and the coined name remains the same today.

G. Hamilton Mowbray, owner of Montbray Wine Cellars, Westminster, Maryland was the first winemaker in the world to commercially produce Seyval. His first 50 vines were planted in 1955. In 1964, he made the first commercial planting of 500 vines. He is the only winemaker today to name his wine, Seyve-Villard, in honor of its hybridizer. For his efforts in quality Seyval production, Mowbray was awarded Chevalier de Merit Agricole (The Order of Merit of Agriculture) by the French government in 1976—a most prestigious and exclusive agricultural decoration.

For the record, however, the correct name for the variety is Seyval. The 'blanc' should not be used since there is no other color form of this grape, according to Dr. John R. McGrew, a retired research plant pathologist from the fruit laboratory of the Horticultural Science Institute, U.S. Department of Agriculture in Beltsville, Maryland.

In addition to disease resistance, Seyval is winter-hardy as is the case with most hybrid varieties, making it suitable for vineyards in the northeast. Seyval is vinified totally in stainless steel as a light, fruity, crisp style or barrel fermented and/or barrel aged. The upright growth of Seyval makes the double Guyot, also known as Keuka high renewal, a good training system. With this trunk and double-arm training, trellises fill rapidly, and one problem with Seyval, cluster- thinning, is simplified.

Excess clusters must be removed to control crop size. Severe pruning of Seyval would accomplish this, but quite often vine vigor suffers afterwards. Seyval bunches are exceptionally tight, and berry-splitting can result in growth of gray-mold patches. This mold must be removed from bunches at harvest. Considering the myriad problems encountered with other hybrid-grape varieties, those mentioned here for Seyval are minimal in comparison.

Wineries in Maryland, Michigan, Missouri, New York, Ohio, Pennsylvania, and Virginia have had success with Seyval. Winemakers and consumers alike speak positively of Seyval.

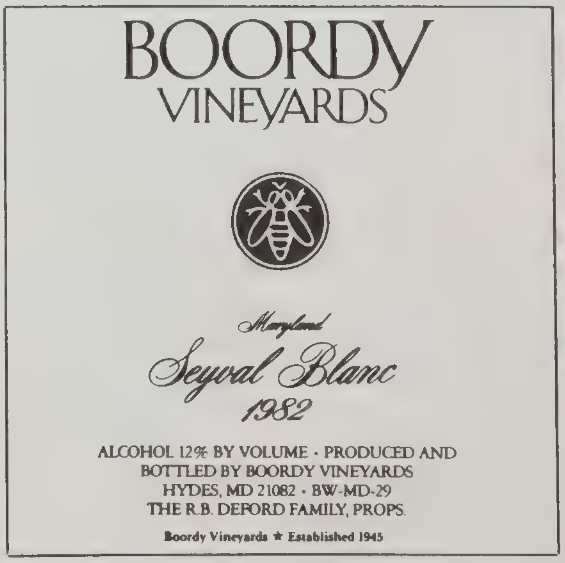
BOORDY VINEYARDS

PW: Describe your style:

Robert Deford: Our version is crisp, clean, dry, well-rounded with a hint of oak and moderate varietal aroma. It is a food wine with backbone, making it a good accompaniment to both fish and chicken dishes. I fault many Seyvals for being too thin in body. The challenge in making this wine is to achieve a well-rounded, middle body to complement the varietal aroma and crisp finish. This can be done in several ways: finish the wine with a small amount of residual sugar, age the wine in oak, or extend lees exposure time. We are experimenting with all three methods. We used oak to round out the '82 Seyval. We bottle in May and the wine shows well three months after release and has improved with up to three years of bottle age.

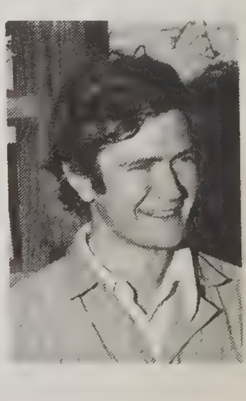
PW: Describe the vineyards:

RD: We draw from five vineyards all within 50 miles of the winery. The vineyards are hand-harvested, yield about three


BOORDY
VINEYARDS

Maryland
Seyval Blanc
1982

ALCOHOL 12% BY VOLUME · PRODUCED AND
BOTTLED BY BOORDY VINEYARDS
HYDES, MD 21082 · BW-MD-29
THE R.B. DEFORD FAMILY, PROPS.
Boordy Vineyards ★ Established 1945


Robert Deford

tons/acre and are rated about 3,000 degree days/year. Three 18-year-old vineyards are within a 20-mile radius of Baltimore and the 15-year-old Cedar Point Vineyard is on the eastern shore of Chesapeake Bay. These four vineyards have sandy loam soil. The vineyards near Baltimore have a clay subsoil; Cedar Point's subsoil is sandy. Summer temperatures have reached 95 °F for five days at a time. Winter lows, not including a wind-chill factor, have dropped to -4 °F for two days. Frost damage occurs, if at all, in early May. Winter injury has not been a problem in these vineyards.

The 12-year-old Provenza Vineyard in Montgomery County, just outside Washington, DC, has a clay-loam soil and clay subsoil. Here, summer highs can reach 95 °F and winter lows of 15 °F are common. Frost danger occurs between April 21-May 15. Winter bud injury is a possibility when there are fluctuating warm days and cold nights less than 20 °F.

We use bilateral cordon training. The vertical portion of the permanent trunk rises 42 inches to the first wire and lateral arms extend 24 inches along the wire. Seyval is our only hybrid with tendency to produce second and third crops. These clusters may never ripen and will detract from first-crop quality, so cluster-thinning is essential.

PW: When are the grapes picked?
RD: The best wines come from fruit harvested between 18.5-21.5° Brix with a TA below 1.0, ideally 0.85. Experimental batches made from late harvest Seyval had some undesirable qualities, suggesting perhaps too much of a good thing. I have not experimented with botrytized Seyval fruit. I believe the best pH is 3.3, but I let the total acid guide my decision to harvest at all vineyards.

Grapes are usually picked during the third week in August from Cedar Point and by September 10 for the remaining vineyards. Cedar Point ripens earlier due to the moderating effect of the bay. Bud break, flowering, and veraison at Cedar Point all occur about two weeks ahead of the other vineyards. Provenza Vineyard, located south of the bayside vineyard is always ten days ahead of the other vineyards, but behind Cedar Point.

Provenza provides 25% of the blend and 44% comes from Carroll Vineyard, which is near Baltimore. Cedar Point and Long Green Vineyard, adjacent to the winery, each contributed about equally for a total of 19%. Wagner Vineyard near Baltimore added 8% and 4% came from a West Virginia vineyard, no longer delivering Seyval to Boordy due to a high acid problem.

PW: How is the wine made?
RD: 60 ppm SO_2 is added at the crusher followed by immediate pressing to yield 150 gallons/ton. Juice is settled overnight, racked and inoculated with 1% freeze-dried Montrachet yeast. In 1982, 10% amelioration with a sugar-water solution was necessary to obtain 22° Brix and a TA of 0.83. Fermentation temperature was held at 60 °F and finished at less than 0.5% residual sugar in four weeks. The free SO_2 level was adjusted to 20 ppm to prevent malolactic fermentation. The wine was racked three times under a CO_2 blanket. 2 lbs/1,000 Gal of bentonite was added to pass our heat stability test of 140 °F for 24 hours. The wine was placed in new Maryland white oak cooperage for 15 days and given a medium filtration. A 0.45 *u* membrane preceded the filler at bottling.

CEDAR HILL WINE COMPANY

PW: Describe your style:
Tom Wykoff: We strive for a white Burgundy style with all the rounded flavors of barrel fermentation and appropriate barrel ageing. Our finished wine is 12% alcohol with a TA of about 0.7 and 3.2-3.4 pH, as much as we can control it. Relatively high acidity makes the wine complement fish, foul or veal dishes served with a heavy cream or butter sauce. Oak background also lends to the wine's ability to handle fuller flavored dishes. We bottle Seyval in July. It is ready to drink after six months of bottle age and continues to improve for up to five years.

PW: Describe the vineyards:
TW: We buy grapes from two vineyards in northeast Pennsylvania on the southeastern shore of Lake Erie. The Bucholz Vineyard has gravelly-loam soil and the Owens Vineyard has silty, clay-loam soil. Both have limestone subsoil. Climate is tempered by Lake Erie. Bud break occurs in the first week of May followed by berry set about June 20. Winter lows are approximately -5 °F but it can get as low as -20 °F, dictated by the freezing of Lake Erie during a particular winter. Summer highs reach no more than 90 °F. A four-cordon trellis system is employed. Grapes are harvested both by hand and mechanically, with an average yield of five tons/acre.

PW: When are the grapes picked?
TW: We want to pick clean fruit, under 20° Brix, to prevent an overripe character in the finished wine. Grapes are usually ready by the end of the first week in October, generally, between 18- 20° Brix with 0.9-0.95 TA and a low pH of 3.0.

PW: How is the wine made?
TW: 70-100 ppm SO_2 was added at the crusher, depending on the grapes' condition. Grapes were pressed immediately with yield between 139-147 gallons/ton. Must was settled for 24 hours at 50 °F, racked and chaptalized to 21° Brix. Must was transferred to 52-gallon decharred American oak whiskey and Bluegrass barrels. Pasteur, freeze-dried Champagne yeast was added at 3% inoculum. 70% of the '82 lot was fermented in whiskey barrels and the remainder in five-year-old Bluegrass barrels. Fermentation temperatures peaked at 80 °F.

Tom Wykoff

1982

Chateau Lagniappe

Lake Erie
Seyval Blanc

PRODUCED AND BOTTLED BY THE CEDAR HILL WINE COMPANY
CLEVELAND HEIGHTS, OHIO ALCOHOL 12% BY VOLUME

Natural malolactic fermentation finished in 1-2 months with topping-up every two weeks. First racking of the wine follows malolactic completion and SO_2 is adjusted to 30 ppm if the pH is 3.3. A lower pH would require a lower SO_2 level. Barrel ageing occurs in a combination of whiskey barrels and Yugoslavian and French oak barrels for 6-12 months. An average of 1.5 lbs/1,000 gallons of bentonite is added to satisfy our heat stability test of raising a wine sample's temperature to between 100-120 °F for 12-hour periods on each of three days. A 0.45 *u* membrane is used at bottling.

FENN VALLEY VINEYARDS

PW: Describe your style:

Doug Welsch: I try to emphasize intense Seyval fruitiness. The wine finishes crisp with about 11% alcohol and good balanced acid, about 0.74. I let the grape speak for itself in the wine, rather than for me. We had problems fermenting the '82 Seyval to complete dryness. Fermentation would not drop below 0.44% residual sugar. Actually, I wanted less than 0.2% RS. Our Seyval style will accompany the following foods: poached fish, chicken Wellington, seafood gumbo, seafood mousse and chicken or fish salads. It is particularly well-suited to cream style soups or bisques. The wine can be appreciated upon release or through eight years of bottle age. Some of our '74 Seyval, made in the same style, is still drinking well.

PW: Describe the vineyard:

DW: Well-drained Fenn Valley soils are deep loamy-sand to sandy-loam. Below the topsoil is 30-80 inches of sand, laced with very thin layers of clay. The vineyard is planted on ancient sand dunes that were later the shoreline of a large body of water. Subsoil is rather acidic and non-fertile, which is typical of areas that were once covered with forest — as this was. Winter lows range from 0 to -10 °F. The '81-'82 winter low was -9 °F. Summer highs, usually no more than 5-10 days, can peak at 90- 95 °F. We have approximately 2,800 degree days/year and 180-187 potential growing days between April 20 and October 30.

Seyval is grown on two-arm Kniffin with 26 buds (2 × 12 + 2 − 1 bud renewal spurs). The first trellis wire is three feet above ground and the second, three feet above the first wire, maintaining a high head. Thinning is done to one cluster/shoot. We bunch-thin in combination with severe pruning to achieve 4- 4.25 tons/acre maximum yield. Bunch thinning is often overlooked when actually it is as important as severe pruning. We have had better wines since we began bunch thinning. It is costly but it works!

PW: When are the grapes picked?

DW: We pick generally between October 10-15. Brix levels are about 20° with acid between 0.95-1.0. In '82, we had 172 growing days and 2,752 degree days during the growing season, which is a typical year for us. I graph the TA, Brix and pH during the last four weeks of ripening. When the curves flatten or pH reaches 3.2, harvest begins.

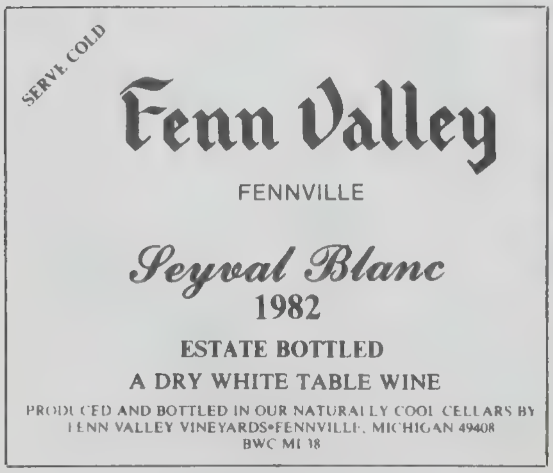
PW: How is the wine made?

DW: 75 ppm SO_2 and pectic enzyme are added prior to crushing. The exact amount of enzyme added must remain non-specific since the product sold by different manufacturers has different prescribed addition/1,000 Gal rates. Pressing was done immediately with a bladder press, yielding a total of 162 gallons/ton, followed by centrifuging and cooling to 55 °F. Acidex was added to achieve 0.87 acid level. Freeze-dried Epernay II yeast was used at 1 lb/1,000 Gal.

Fermentation was controlled at 52 °F and 4 lb/1,000 Gal of bentonite was added when the must reached 10° Brix. Adding bentonite during fermentation is a technique I learned in Germany. There, they are convinced that addition of bentonite before the onset of fermentation strips nitrogen compounds from the must that are needed as yeast nutrients. When bentonite is added at the mid-point of fermentation, only one racking is required before the cold stabilization racking. I'm now convinced that this method makes a fruitier wine.

From past experience, I know that the addition of 4 lb/1,000 Gal of bentonite produces a 99% heat-stable wine. I use the TCA (trichloroacetic acid) test on wine samples brought to the boiling point. I will add more bentonite if a haze forms after the samples have cooled.

After fermentation is completed, the wine is centrifuged and 50 ppm SO_2 is added. Very early in January, after the temperature lowers to 29 °F, the wine is racked and cold stabilized by seeding with 17 lb/1,000 Gal KHT. The wine is racked again in early April. With the '82 wine, 3 lbs/1,000 Gal of PVPP was added to counter a 'pinking' problem. A week later the wine was tight pad filtered and 10 ppm SO_2 added. A 0.45 *u* membrane was ahead of the filler at bottling.



SERVE COLD

Fenn Valley

FENNVILLE

Seyval Blanc

1982

ESTATE BOTTLED

A DRY WHITE TABLE WINE

PRODUCED AND BOTTLED IN OUR NATURALLY COOL CELLARS BY
FENN VALLEY VINEYARDS•FENNVILLE, MICHIGAN 49408
BWC MI 38

Doug Welsch

GLENORA WINE CELLARS

PW: Describe your style:

Michael Elliott: We are looking for a crisp, light, fruity wine with about 1% residual sugar. In actuality, the '82 vintage has the following stats: 11.8% alcohol, 1.1% RS, 0.775 TA, and 3.12 pH. The wine has a green apple character that makes it a good cocktail or aperitif wine. The '82 Seyval has 6% Cayuga blended in to add fruitiness and body. Blended above 10%, Cayuga's distinctive fruitiness imparts too much of its own character. After several years of 100% varietal bottling, winemakers at newer Finger Lakes wineries in New York are finding great rewards in blending. We maintain Seyval levels above 75% so that we may still use varietal labeling. Our Seyval is ready to drink upon release in April. It can be appreciated then for its youthfulness, and can be enjoyed for 2-3 years longer.

PW: Describe the vineyards:
ME: Spring Ledge Vineyard, directly adjacent to the winery on the western slope of Lake Seneca, is our major source of Seyval. Depending on the year, we may bring some grapes in from Cayuga Lake. We use Anchor Acre Vineyards on the east shore of Seneca Lake also. There is no real difference in the wine made from Seyval fruit from either Seneca vineyard due to microclimate or soil characteristics.

The lowest winter temperature in January 1982 was -3 °F, a normal low. Frost damage can occur in May. Injury to the buds may occur if temperatures go below -15 °F. Vine injury can happen when temperatures go below -20 °F. However, most winter injury is done when temperatures drop drastically in a short period. In December 1980, the temperature dropped from 48 °F to -10 °F in a 12 hour period. Highest summer temperatures reach mid 90's, and often occur with high humidity levels. This region receives about 2,100 degree days during a growing season. Climate is tempered by Seneca Lake. Vineyards are an average of 700 feet above sea level, and 300 feet above Seneca Lake. Soil is Howard gravel with a depth of 48-72 inches on a 4-6% slope. Subsoils are slate or heavy clay.

PW: When are the grapes picked?
ME: We harvest anywhere in a three-week period between September 20 and October 12. We look for Brix readings between 20-21°, acid about 0.9 and pH of 3.05-3.1.

PW: How is the wine made?
ME: We crush and press the grapes immediately, obtaining an average yield of 170-175 gallons/ton. No SO_2 is added before fermentation. The juice is centrifuged to about 1% solids and fermented with freeze-dried Montrachet at 1% inoculum in stainless steel at 52-55 °F for about three weeks. The wine is centrifuged when the residual sugar is about 1% and 60 ppm SO_2 is added. The '82 Seyval was protein stable by our test of boiling 10 mL aliquots of wine with 2 mL of TCA for 2 minutes which showed no precipitation when cooled. Acidity was reduced to 0.775% with calcium carbonate. After about ten weeks, the wine received a polish pad filtration off the calcium tartrate lees. Cold stabilization at 30 °F for two weeks was done during that period. The wine went through a 0.65 *u* membrane ahead of the filler.

Vines are balance-pruned, 25 buds for the first pound of brush weight, then 10 buds for each additional pound. A three-wire trellis and the Umbrella Kniffin training system are used. We have found that this is best for distributing the vine on the trellis for maximum exposure to the sun and for air movement, which aids in fruit ripening as well as wood maturity for the next year's crop. The fruit is cluster-thinned to one cluster/bud. Mature vineyards produce 6.4 tons/acre. Seyval is more of a problem viticulturally than it is enologically because of its vigor. Even thinned back to one cluster/shoot, it may produce eight tons/acre. Clusters are very tight and susceptible to bunch rot. Kept clean, however, they ripen to a lovely light brown color.

Mike Elliott

1982
Glenora
SEYVAL BLANC
FINGER LAKES
PRODUCED AND BOTTLED BY
GLENORA WINE CELLARS, DUNDEE, NEW YORK 14837
Alcohol 11.8% by volume

MEREDYTH VINEYARDS

PW: Describe your style:
Archie Smith III: We produce two different Seyvals. One is labeled Seyval Blanc while the barrel fermented and barrel aged Seyval is labeled Special Reserve. We want our regular Seyval to have lots of ripe fruit flavors and noticeable but not overpowering oak. It is a wine crisp enough for shellfish or other seafood. This wine can be enjoyed upon release and for up to five years. With the barrel fermented wine, we look for a more complex, riper, rather oakier version. It is a mature fruit style wine, well balanced, with some oak in the nose. It is round, rich and full-bodied enough for veal and poultry. This wine shows best about three years after release and will last about five years.

PW: Describe the vineyards:
AS: Our soils are silt loam with a pH approximately equal to 5.5 and the subsoil is clay. Our vineyards have a very slight slope and principally southeastern exposure. A range of 2,800-3,200 degree days occur annually. The lowest winter temperature is - 5 °F. Summer highs rarely exceed 95-100 °F, and never for sustained periods. Frost damage can occur from April 6-May 10. Winter kill is rare but could occur if temperatures were to be as low as - 15 °F. However, it must be pointed out that winter injury depends on more than the lowest low temperature.

In particular, degree of wood ripeness is important and that, in turn, depends upon the character of the growing season and crop load. With well-ripened wood, Seyval should be safe to -15 °F but it is hard to be sure. Approximately 622 Seyval vines/acre are planted and are spaced 10X7. We use a high-cordon trellis system and cluster-thin to prevent overcropping. Grapes are hand-picked and yield 4-5 tons/acre.

PW: When are the grapes picked?
AS: I look for sugars between 21.5-23.0° Brix. At crush, I want the pH to be less than 3.4. We harvest about mid-September. Grapes for the barrel fermented lot hang about a week longer than those harvested for the regular Seyval. This raises the sugar level about 1° Brix.

PW: How is the wine made?
AS: The regular Seyval has 40 ppm SO_2 added at crush, is pressed immediately yielding 170 gallon/ton and is settled for 72 hours at 50-55 °F. There seems to be a protein related, sulfide production problem. To combat this, we add 2 lbs/1,000 Gal bentonite at crush. Fermentation of the regular Seyval takes place in 2,200-Gal American oak at 50-55 °F with freeze-dried Epernay yeast at 1% inoculum. After fermentation, the wine is medium DE filtered off the yeast lees and aged in 1,200-Gal American oak for approximately ten months. Casks are topped weekly. The wine is chilled to 26 °F for four weeks and is sterile-pad filtered at bottling.

Crush, pressing and settling of the barrel-fermented lot is

VINTAGE 1982
Meredyth.
VIRGINIA
SEYVAL BLANC
GROWN, PRODUCED AND BOTTLED BY
MEREDYTH VINEYARDS, MIDDLEBURG, VIRGINIA 22117
ALCOHOL 12% BY VOLUME

Archie Smith III

essentially the same. Fermentation is done in 50-Gal American oak barrels beginning with must at 45-50°F and takes four months due to the low temperature. After fermentation, the wine was fined with 0.5 lb/1,000 Gal Sparkalloid and aged in 50-Gal American oak barrels for four months. Sterile pad filtration was done before bottling.

We add bentonite early to clean up the juice and Sparkalloid later to help the wine fall clear. Bentonite breaks down proteins and removes them from solution. Some proteins release sulfides when they break down. We add bentonite before crush so that any sulfides produced will be carried away during fermentation. Usually, pre-fermentation treatment with bentonite removes any further need for its use.

Sparkalloid serves as a general aid for the removal of suspended solids, not for removal of proteins from solution. We used it in the barrel fermented lot to help get the wine clean prior to filtration. Sparkalloid rarely gets Seyval totally clean for us, and consequently the removal of remaining solids via sheet filtration is difficult. DE filtration can remove relatively large amounts of solids much more efficiently than pads.

In 1982, I wanted to clean up the regular wine very quickly. I DE filtered without waiting for a Sparkalloid fining. Now, I am more confident about the pre-fermentation bentonite effect, and I fine the regular Seyval with Sparkalloid before DE.

There was only a small amount of the 1982 barrel fermented lot. Therefore, we could not practically DE filter it and instead had to rely upon Sparkalloid and sheet filtration after detartration. Fortunately, it worked.

MONTBRAY WINE CELLARS

PW: Describe your style:

G. Hamilton Mowbray: I am influenced totally by a French winemaking style. Our Seyval is produced in a style very similar to the way Chardonnays are made in Burgundy. It has less than 0.5% residual sugar, 12% alcohol and a medium acid balance of 0.6-0.8 to accompany food. It is a fine accompaniment for shad-roe, smoked salmon, ham, shrimp, veal roast, brie, camembert and charcuterie. The wine is ready to drink upon release and will improve with up to ten years of bottle age and for most vintages, is at its optimum in six years. What I might do with one vintage is not necessarily what I might do with another. I work with what I get from the vineyard and God's largess or lack thereof.

PW: Describe the vineyard:

HM: Our soil is Mount Airy Channery, Glenelg and Linganore. These are pre-Cambrian soils, many millions of years old, derived from mountains as tall as the Rockies, that used to be on the east coast before life began. These soils are metamorphic rock, essentially slate, schist and granite with good drainage and clay subsoil. The topsoil ranges between 2½-10 feet. A normal winter low is -3°F and summer high about 92°F. 2,860 degree days are accumulated from April through September. Frost damage can occur between April 25-May 5. We worry about winter vine damage when temperatures stay at -10°F for a period of three days.

Silver Run Valley stepped-bilateral cordon is our training system. This is a Montbray invented system with a low wire about 30 inches off the ground and a permanent cordon that runs out about three feet. The main trunk goes on up to the second wire which is two feet above the first and another permanent cordon goes out three feet on this wire. We prune leaving about five to six spur sites on each cordon to yield about 3.75 tons/acre.

Typically, our young Seyval vines show high acidity at harvest but once the vines plateau at about 12 years, we have no problems with acid-sugar balance. This is regionally characteristic for Seyval grown in our area. The majority of our vines are now older than 17 years.

PW: When are the grapes picked?

HM: We hand-harvest at the end of September, from about the 17th through October 1. We look for sugar between 18-20° Brix and total acid between 0.7-0.9%. I do not measure pH. I know from my experience of growing these vines in this area for 25 years, that if the sugar is right, the acid is going to be fine and we will not have any problems. I counterbalance biological ripeness with a taste factor. I go into the vineyard and taste several bunches of grapes from various parts of the vineyard, and make decisions on when to pick based on sugar parameters and fruit taste.

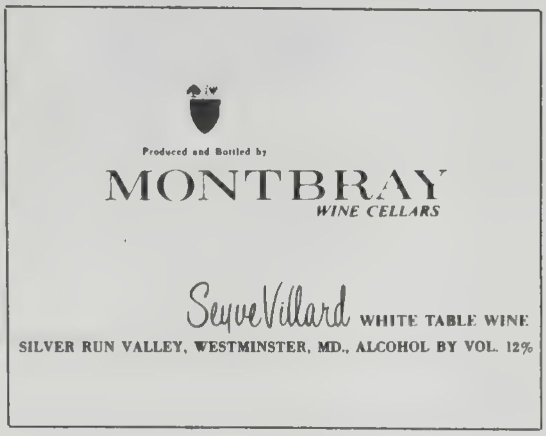
PW: How is the wine made?

HM: 100 ppm SO_2 is added at crush and as needed during racking to maintain 20 ppm free SO_2. Our yield is 130-145 Gal/ton. As the juice comes out of the press, 300 grams/125 Gal bentonite is added, followed by 36-40 hours of settling time at ambient cellar temperature. We make this bentonite addition now, rather than fining with Sparkalloid later. Sparkalloid produces a large amount of disturbable lees. When you start to rack off, you lose more wine than with the early addition of bentonite. Cleaning up the juice by bentoniting early pulls out the proteins and makes the juice tartrates unstable. It offers easy clarification and shortens the entire cold stabilization period.

The must is racked from the settling tanks into wooden fermenters. Freeze-dried Montrachet 522 yeast is used at 1% inoculum level to ferment the wine to dryness between 58-62°F. Fermentation will vary between 10-14 days in barrel and as long as 30 days in the 2,300 Gal cooperage. The blend of vineyard musts is fermented in the large tank, and single lots in small barrels.

As soon as fermentation is complete, at ambient temperatures of 48-55°F, the doors of the cellar are opened to bring the winery temperature into the 30's for cold stabilization which is complete by mid-January. The first racking after consolidation is done at this time. To test for heat stability,

H. Mowbray



Produced and Bottled by

MONTBRAY

WINE CELLARS

SeyveVillard WHITE TABLE WINE

SILVER RUN VALLEY, WESTMINSTER, MD., ALCOHOL BY VOL. 12%

I warm several samples to 90-100°F. If a haze forms after cooling, I re-fine with bentonite.

The wine is 100% barrel fermented and sees only oak until bottling. We use American oak from Missouri, Kentucky and Tennessee. After air-drying, the wood is cut into staves in a town about 15 miles west of the winery. The staves are shipped to Spain, made into 130-Gal Sherry butts and shipped back. Many of the barrels have a light char. Wine in these barrels has a distinctly different taste than that aged in barrels without char. We eradicate differences by blending, but in some cases we like it so well that we bottle it as a special lot. Wine remains in oak for one year. We top at intervals that depend on the age of the wine.

We filter with a membrane filter, just before bottling, normally a 3 *u* first, followed by 1.2 *u*.

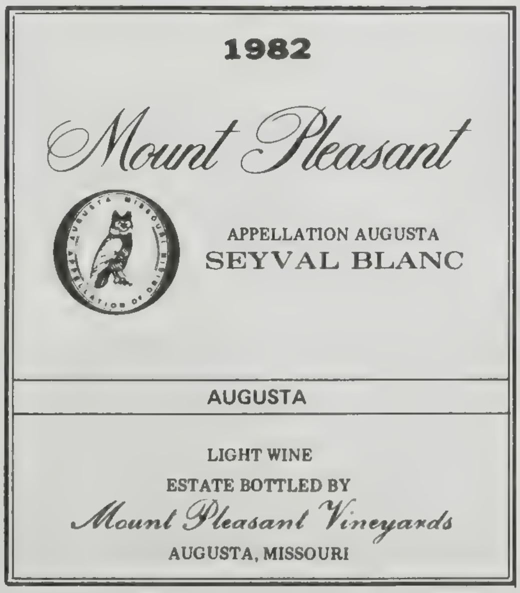
MOUNT PLEASANT VINEYARDS

PW: Describe your style:

Paul Burdick: I want our Seyval to be a crisp, dry wine that can accompany food but with enough balance to be enjoyed by itself. Seyval should have a full, rich body with pronounced varietal characters—grassy and herbaceous when young and smokey, wood-like when bottle aged a few months. This is achieved without barrel ageing. Our style of wine accompanies seafood, especially shellfish, as well as other traditional white wine foods.

9% Vidal was blended in to make the '82 wine, due to topping requirements for the amount of Sevyal produced. We used our best available white which was Vidal. However, we do believe that the Vidal adds to the overall complexity of the wine, increasing body and ageing potential. Due to the success of the '82 wine, we will continue to consider Vidal for the final blend, now as a matter of style, not just necessity. Our Seyval is ready to drink when released. Since this is a new wine for us, I hesitate to set limits on a consumer's appreciation of our Seyval.

Paul Burdick



1982

Mount Pleasant

APPELLATION AUGUSTA

SEYVAL BLANC

AUGUSTA

LIGHT WINE

ESTATE BOTTLED BY

Mount Pleasant Vineyards

AUGUSTA, MISSOURI

PW: Describe the vineyards:

PB: Our estate plantings are on very deep, silty loam with 16-foot deep topsoil which provides excellent water retention for dry farming practices, even in drought years. Our climate tends towards hot, hazy summers and cold winters, with summer peaks averaging mid-90°F temperatures and winter lows of -15°F. This however, varies greatly from year-to-year and particularly, week-to-week, during the growing season. Heat summation is typically 3,500 degree days. Spring frost damage can occur from April 20 to May 1. Depending on the month, the degree of dormancy, number of freezing and thawing periods, winter kill will occur if the temperature remains below -5°F for three days.

The vines are trained to a two-wire vertical trellis with bilateral cordons. Hand harvesting yields vary with the vintage. In 1982, we had just over 0.5 ton/acre on a second crop, after we lost the primary buds to frost. In a normal year, however, we average nearly seven tons/acre. Since our Seyval plantings are only five years old, we have yet to determine all the critical factors for our area.

PW: When are the grapes picked?

PB: Harvest can occur between August 17 and September 27 depending on the growing season and whether we lost primary buds due to a late spring frost. We pick, when sugar levels are 19-20° Brix, acid between 0.85-0.95 with 3.1-3.2 pH.

PW: How is the wine made?

PB: We add 40-50 ppm SO_2 at crush along with 18-25 g/ton pectic enzyme to aid in free run yield. The skins are pressed immediately and the light press is added back to the free run, making the total press yield about 167 Gal/ton. Juice is settled overnight at 40°F after addition of 1 lb/1,000 Gal bentonite, and racked the next day into fermenters. Juice is chaptalized to 22° Brix, and inoculated with 1 kg/1,000 Gal freeze-dried Epernay II yeast. Fermentation temperature is maintained at 60°F until 2° Brix. Temperature control is discontinued, and fermentation allowed to continue to dryness (about 0.2% residual sugar). This takes seven weeks. The wine is racked and an addition of 30 ppm SO_2 is made.

The wine is cold stabilized naturally by the Missouri cold winter in the temperature range of 30-35°F for 2-4 weeks followed by 1 lb/1,000 Gal well-dispersed bitartrate seeding. To clarify the wine further, 2 lb/1,000 Gal Sparkalloid is added, and a rough pad filtration is done. Prior to bottling, the wine is given a tight polish pad filtration and a final SO_2 adjustment to 25 ppm free.

Seyval and other hybrids have shown a tendency toward a very long and drawn out fermentation period with Epernay yeast. This allows yeast autolysis and is a benefit as long as the fermentation does not stop before dryness. Another problem is the grape's tendency toward oxidative browning. We control this with early introduction of SO_2 at the crusher and bentonite fining immediately after pressing. Early bentonite addition helps to pull out both proteinatious enzymes and phenolic substrates that cause browning. Filtered samples are brought to boiling and inspected after cooling for haze, if none, the wine is heat stable.

NAYLOR WINE CELLARS

PW: Describe your style:

Dick Naylor: Our wine is complex and definitely a food wine. Fermented to total dryness, (less than 0.2% residual sugar) it makes a good accompaniment for fresh oysters, stuffed lobster, steamed clams and cold chicken. I look for Seyval to have greenish tints, to be fruity and crisp with oaky overtones upon release in July. After a year of bottle age and up to five years, our Seyval expands its bouquet and develops mouthfilling roundness and complexity.

PW: Describe the vineyards:

DN: Our vineyards are at 950-1,000 feet elevation, with an 8-15% slope to the southeast. The deep soil is Chester loam and well-drained. We have abundant rain—about 45 inches annually into early July. It remains relatively dry through harvest unless an Atlantic hurricane develops. Summer daytime highs range between 85-95°F with nights at 55-70°F. Winter temperatures do drop below -10°F every 3-4 years. A low of -14°F was recorded in the winter preceeding the '82 harvest. We worry about winter kill when the temperature stays below 0°F for 4-5 days. We average about 3,200 degree days annually. It takes 2,800 degree days to ripen Seyval in our region. We use four-arm Kniffin training with most buds left on the bottom canes. We cluster-thin to one bunch/shoot for a yield of 20-25 lb/vine. Bunch rot is a problem with Seyval. If we do not have rain from late August through the harvest period, bunch rot will not develop.

PW: When are the grapes picked?

DN: Grapes are harvested in late September, between the 21st and 30th, at a yield of 9-10 tons/acre from vineyards planted with 650 vines/acre. Ideal Brix is 19-21.5° Brix, total acid of 0.75- 0.9 and pH between 3.15-3.35. Essentially, we pick when the acid and pH are in range.

PW: How is the wine made?

DN: 50 ppm SO_2 and 75 ppm pectic enzyme is added at crush. Skin contact of 6-8 hours follows. We achieve a yield of 165 Gal/ton after pressing and the juice is settled 24 hours at 60°F before being racked to stainless steel fermenters. Fermentation with freeze-dried Champagne 505 yeast begins the day after inoculation and continues at 55-60°F for approximately 3½ weeks. When 5° Brix is reached, we inoculate with PSU 1 malolactic culture. The wine is racked 2/3 to American oak and 1/3 to Limousin oak with an accompanying addition of 30 ppm SO_2. The wine stays in cooperage with fermentation locks for about four months and is topped every three weeks. The wine is racked and fined with 1.9 g/Gal bentonite and filtered with an 0.25 *u* membrane before bottling at 35 ppm free SO_2. We use a TCA test for heat stability. Fining trials are made, and retested with TCA to determine the minimum addition of bentonite needed to remove unstable proteins.

ESTATE BOTTLED
NAYLOR
1982
YORK COUNTY
SEYVAL
Fruitfully Dry
White Table Wine
GROWN, PRODUCED AND BOTTLED BY
NAYLOR WINE CELLARS, INC.
STEWARTSTOWN, PENNSYLVANIA

Dick Naylor

NISSLEY VINEYARDS

PW: Describe your style:

Richard Nissley: Our style is dry, slightly fruity, crisp yet mild, with medium alcohol levels between 9-11%. With residual sugar at 0.5%, our Seyval is a dinner wine ideally suited for chicken, fish and veal. Our wine can be appreciated upon release in July and from 4-5 years after that.

PW: Describe the vineyards:

RN: Our vineyards are on the top and side of a hill at an elevation of 273 feet and approximately 50 feet above the nearby Susquehanna River. Soil is Hagerstown loam limestone. Subsoil is clay hardpan which we break up before planting. This produces water pockets. Vines can use this water in the event of drought. The average winter low is -10°F and summer highs can reach 105°F for 1-2 days. In '82, we had one week of 100°F temperatures for a week.

Frost damage to primary buds can occur from May 1-15. Winter vine damage is not a problem. The site has 160-180 growing days/year, which is about 20 more than needed for ripening Seyval. Grape yield is 7 tons/acre. Normal rainfall is 42 inches annually. We get 3-4 inches/month during the growing season and 2-3 inches during harvest period. We use a T-system for training and thin to one bunch/shoot. 125 lbs of nitrogen/acre, as ammonium nitrate, is applied and we spray to control bunch rot. Six acres are planted to Seyval; 600 vines/acre planted eight feet apart.

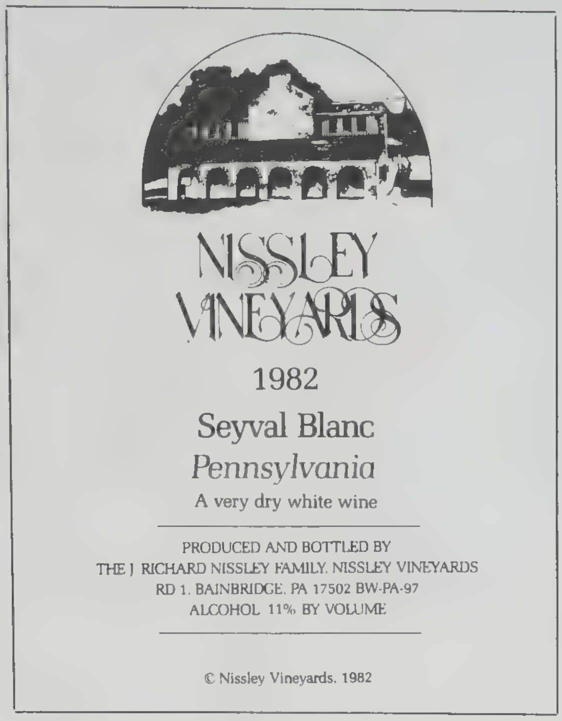
PW: When are the grapes picked?

RN: We regularly pick between September 2-13. Ideally, when the pH reaches 3.15-3.20, we pick. We will have 18.4-19° Brix and total acidity is in the range of 0.95-1.13 with a pH range of 3.08-3.22. When the total acidity is over 1.0, we balance with dextrose and make a sweeter wine.

PW: How is the wine made?

RN: Grapes are crushed and pressed immediately at a press yield of 150-160 gallons/ton. To reduce solids, we settle the must at 33°F for a period of 75-100 hours. 10 ppm free SO_2 is added at the crusher, and after fermentation has finished, is thereafter maintained at 25-30 ppm. Must is pumped into 3,000-5,000 gallon stainless steel fermentation tanks. Fermentation was completed between 50-60°F in six weeks with liquid culture Epernay yeast, added as 3-10% active inoculum.

Richard Nissley



NISSLEY
VINEYARDS
1982
Seyval Blanc
Pennsylvania
A very dry white wine

PRODUCED AND BOTTLED BY
THE J RICHARD NISSLEY FAMILY, NISSLEY VINEYARDS
RD 1, BAINBRIDGE, PA 17502 BW-PA-97
ALCOHOL 11% BY VOLUME

© Nissley Vineyards, 1982

Wine is racked off the yeast lees late in the fermentation process, and twice after that.

Sparkalloid is used in the amount of 1 lb/1,000 gallons as the fining agent during the natural cold stabilization period, lasting four weeks at a temperature of 28-30 °F. To test heat stability, we bring samples of wine to 120 °F. After the samples cool, we check for precipitation. It should be noted however, that we have never had protein instability in our Seyval. Before bottling, we tight pad filter and then there is a 0.45 *u* membrane ahead of the filler. The wine is generally bottled no later than June of the year following harvest.

THE ROLLING VINEYARDS

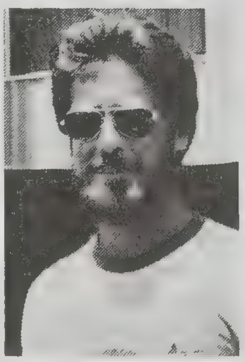
PW: Describe your style:
Ed Grow: Our style is semi-dry with approximately 1% residual sugar and 12% alcohol. It is a clean wine with slightly fruity character, suitable as a dinner wine. I find it particularly good as an accompaniment for broiled scallops, mild seafood dishes and chicken. We release Seyval in early June. As a newly released wine it is fresh with a predominantly fruity character. It can be aged for three to four years. As a bottle-aged wine, the Seyval fruity character diminishes as the wine smooths out and acquires a fuller body.

PW: Describe the vineyards:
EG: Our five acres of Seyval are located on the east side of Seneca Lake in the Finger Lakes District at a 600-800 feet elevation above the lake. Soil is composed principally of Lansing gravel and a subsoil of glacier formed slopes. Newer Seyval vineyards are planted close to the lake in ground with great soil depth. These vines are very vigorous, and produce more abundant fruit. However, the grapes here are slower to ripen, and we often sell some of this fruit. Our weather is tempered by Seneca Lake but winter lows can reach -10 to -20 °F. If the temperature stays below -10 to -15 °F for an extended period of about two or three days, vineyard winter kill is a distinct possibility. Summer high temperatures range 85-95 °F. Long periods of temperatures near 100 °F are not usual.

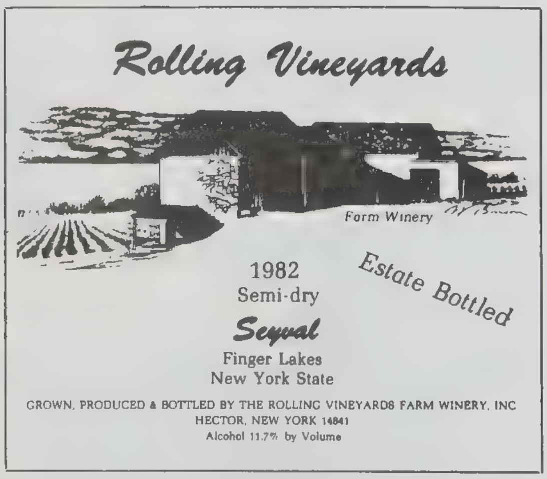
On an average, our region has 185 growing days annually and approximately seven inches of rain during the growing season. Late spring frost can occur from May 10-20. The first spring frost kills primary buds. A second frost damages secondary buds. At that point, we are in real trouble for any harvest yield. In a year without frost damage, we average 2.5-5 tons/acre from vineyards planted 864 vines/acre. Each vine is six feet apart with each row nine feet distant. Our vines average six years of age. We train using a two or three wire trellis and short cane prune. Our newer vineyards have all vines trained on three wires. Our 12-year-old section is on two wires. In 1984, I will install a third wire to help support these vines better. We thin by cluster removal to one cluster/shoot. The single most important viticultural factor related to Seyval is thinning by cluster removal to ripen grapes evenly.

PW: When are the grapes picked?
EG: Our grapes are hand harvested in the last week of September through the first two or three days in October at a Brix level from 21.5-24°. Total acid is in the range of 0.9-1.2. I use several factors to decide when to pick. I use Brix levels and acid but more important to me is the taste of the grapes. I don't want the grapes to become over-ripe, yet I want to attain the highest alcohol content for the finished wine as possible. I believe that this makes a fuller bodied wine that will age better.

PW: How is the wine made?
EG: Some grapes may get skin contact for two to four hours and depending on the quantity of grapes being harvested, some will get thrown into the press whole berry. Press yield averages 150 gallons/ton. After pressing, juice is chilled to 45-50 °F, and an addition of approximately 50 ppm SO_2 is made. Settling time averages 24 hours. Must solids are racked off, and both free run and press juice are combined. A 1% inoculum of freeze-dried Epernay II yeast is made. Fermentation is controlled at 55-65 °F, and followed by a rough DE and course pad filtration off the yeast lees. In February, the wine is fined with 1-2 lb/1,000 gallons of bentonite after testing several samples for stability up to 150 °F. Medium filtration is done, and a natural cold stabilization period of two weeks at 26 °F follows. An 0.45 *u* membrane is ahead of the filler when the wine is bottled in early April.



Ed Grow



Rolling Vineyards
Farm Winery
Estate Bottled
1982
Semi-dry
Seyval
Finger Lakes
New York State
GROWN, PRODUCED & BOTTLED BY THE ROLLING VINEYARDS FARM WINERY, INC
HECTOR, NEW YORK 14841
Alcohol 11.7% by Volume

ST. JULIAN WINE CO.

PW: Describe your style:

Chas Catherman: We produce two distinct styles of Seyval. One is totally dry with nine months in American oak cooperage and 1.5 years bottle age. The other, the wine under discussion, is our 'Reserve.' It is fresh, youthful and semi-sweet at 4.5% residual sugar. Intended to be Germanic in style, it is produced by the suiss reserve method. This is the meaning of 'Reserve' that appears on the neck band of each bottle. The suiss reserve method maximizes grape flavors with addition of unfermented Seyval juice before bottling. This increased volume reduces the alcohol level to approximately 9%. Since we pick with fairly high acid, the bottled wine still has about 0.8 TA to keep the wine both fresh and crisp.

This wine can be served by itself as an aperitif or is well-matched to picnic lunches, quiche, fish with sauces, Coquilles St. Jacques and chicken-based casseroles. Our 'Reserve' Seyval is ready to drink upon release in mid-May. Its maximum cellaring potential is three to four years.

PW: Describe the vineyards:

CC: We take Seyval from eight different vineyard locations throughout the Lake Michigan shore area of southwestern Michigan, each having somewhat different soils and degree days. The majority of vineyards are nearly flat or slightly sloping to the south-southeast. Slope, when existing, is only a few degrees. Most of the eight vineyard sites have sandy, light soils with gravel or clay subsoil. My favorite is at the top of a deep gravel deposit at 800 feet elevation with deep gravel subsoil. The character of the must and wine from this site is flinty and earthy. It tends to be less neutral than that from the sandy soils. Wine from this vineyard really improves during barrel ageing.

Half of the crop is mechanically harvested with an average of 5.5 tons/acre. Our trellis is principally four-arm Kniffing. This is an easy system that simplifies removal of second crop clusters. Overcropping is a serious problem with Seyval. If vines are not cluster controlled, uneven ripening and diminished fruit character result. Winter lows can get down to -25°F. If temperatures stay this low for 24 hours, we worry about winter vine injury. Summer highs can get close to 100°F but never for extended periods. Spring frosts that damage primary buds and reduce the harvest potential to 50% of normal can occur from May 1-25. Degree days range between 2,800-3,100. This is more than sufficient to ripen Seyval which requires approximately 2,000 degree days in our region.

PW: When are the grapes picked?

CC: Since we have eight different vineyard sites for Seyval, we have a rather extended harvest period, usually from September 20-October 12 in any given year, give or take a few days at the beginning or end. We are looking for about 18-21° Brix, TA of 0.85-1.0 and pH between 3.1-3.3. Normally acid and pH are not a problem due to our cool evening temperatures. Brix then, is the factor that determines picking time. In an unusual year, when we have many warm evenings and little rain, pH dictates harvest.

PW: How is the wine made?

CC: We centrifuge pressed juice to approximately 2% solids after a skin contact period of three hours at 45-55°F. 50 ppm SO_2 is added at the holding tanks prior to pressing. Fermentation at 1% inoculum with freeze-dried Epernay yeast is carried out at 55°F until dryness is reached between 10-14 days. The wine is centrifuged off of the yeast lees and fined with 1-2 lb/1,000 gallons of Sparkalloid. After racking off of the Sparkalloid lees, the wine is chilled to 26°F for three weeks for cold stabilization. DE filtration is done after cold stabilization. SO_2 adjustments are made after fermentation up to 85 ppm total, and then prior to bottling, up to 160 ppm total.

Protein stability is tested by heating several samples to 125-130°F overnight, but no bentonite treatments have been necessary. The wine is sterile pad filtered and sweetened with Seyval juice to 4.5% residual sugar before bottling in April.

Seyval is somewhat fragile during fermentation. The yeast strain, chosen for fermentation, has a marked influence on the taste of the finished wine. Percent solids remaining in the juice before the onset of fermentation, seems to play a major role in the wine's ability to take wood ageing and to develop complex flavors. Of the white hybrid varieties used in Michigan, Seyval tends to be most neutral in overall character, in my opinion.

St Julian
MICHIGAN
Seyval
Blanc
1982
VINTAGE WHITE TABLE WINE
ALCOHOL 9% BY VOLUME
PROUDLY PRODUCED AND BOTTLED BY
ST. JULIAN WINE CO. INC.
PAW PAW, VAN BUREN COUNTY
MICHIGAN U.S.A. BONDED WINERY MI-23

Chas. Catherman

WICKHAM VINEYARDS

PW: Describe your style:

Bill Lamberton: We're looking for a full dinner style wine with an 11% alcohol level. Seyval in this style is complementary to veal, pork and seafood crepes. Our wine is ready to drink upon release in May following the harvest. At this time, it can be appreciated for its youthful character. We believe that our Seyval continues to develop in the bottle for one to 1½ years.

PW: Describe the vineyards:

BL: The Seyval grapes for the 1982 wine were purchased. 3/4 came from eight-year-old vines on the west shore of Lake Cayuga. The vineyard has a 5% slope and Lansing gravelly, silt-loam soil with glacial subsoil. 1/4 of the blend came from a fruit farm on the east shore of Lake Seneca with four-year-old vines. The soil and subsoil are essentially identical to the Cayuga Lake vineyard. Starting with the '83 harvest, our own five acres of Seyval came into full production. Characteristics of our estate vineyard are very similar to the vineyards we purchased from. Our vineyard is at 650 feet elevation with a topsoil depth of 20 inches.

We planted 700 vines/acre, spaced seven feet apart with rows at nine feet distance. Vines are four-arm Kniffin trained and spur-pruned. Since this is a new vineyard, we have not established the number of spurs/shoot left after pruning. Currently, the gauge is solely related to the pruning weight of each vine. We cluster-thin to one primary cluster/shoot. Harvest yield has varied, depending on harvesting method and vine maturity. Cayuga Lake grapes were hand-picked and came from more mature vines that yielded seven tons/acre. The four-year-old vines were mechanically harvested and averaged only two tons/acre.

Seneca Lake mitigates our climate so that winter lows rarely go below 0°F. The Finger Lakes region has suffered vineyard winter injury in the past. This will happen if temperatures get down to -10°F for 2-3 days. Late spring frosts can occur between May 1- 15. Summer temperatures can reach 90°F. It is rare for us to have extended periods of high heat and humidity near 100°F. We average about 2,200 degree days annually.

PW: When are the grapes picked?

BL: Our Seyval usually ripens between October 2-10. We judge ripeness by the following parameters. Sugar levels were between 21.5-23° Brix, total acid between 0.85-1.0 and pH between 3.0-3.1. The most important factor of the three is total acid.

PW: How is the wine made?

BL: 50 ppm SO_2 is added at the crusher. Pressing follows immediately with a yield between 175-190 gallons/ton. The juice is racked after settling for 72 hours at 38°F. Freeze-dried Champagne 595 yeast is added at 2% inoculum. Fermentation runs at approximately 55°F for 20 days and is stopped at 0.7% RS by lowering the temperature to 30°F. Upon racking off the yeast lees, 50 ppm SO_2 is added and bentonite is added to achieve heat stability. Our heat stability test consists of raising the temperature to 125-135°F for 1-3 days on samples. Cold stabilization follows bentonite addition. The wine was sterile filtered before bottling in early May.

If not watched, Seyval has a tendency to develop H_2S odors. Seyval, in our opinion, has a flat taste character. To perk up the taste components, it needs a blending grape like Cayuga, Ravat 51 or Vidal. Our '82 Seyval contained 8% Cayuga.

Bill Lamberton

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SEYVAL WINEMAKING SUMMARY
JULY-AUGUST 1984

WINERY	HARVEST CRITERIA	SKIN CONTACT	BLENDING GRAPE	YEAST/ FERMENTATION TEMPERATURE	BARREL FERMENTATION	PROTEIN STABILITY (bentonite addition)	TARTRATE PRECIPITATION	COOPERAGE
Boordy *Robert Deford*	18.5-21.5° Brix 0.85-1.0 TA 3.1-3.3 pH	None	None	1% freeze-dried Montrachet 60°F	No	2 lb/ 1,000 G	None	New Maryland White Oak 15 days
Cedar Hill *Tom Wykoff*	18.0-20.0° Brix 0.9-0.95 TA 3.0-3.2 pH	None	None	3% freeze-dried Champagne 80°F	Yes decharred whisky	1.5 lb/ 1,000 G	None	Yugoslavian
Fenn Valley *Doug Welsch*	19-20° Brix 0.95-1.0 TA 3.2 pH	None	None	1 lb/1,000 G freeze-dried Epernay II 48-50°F	No	4 lb/ 1,000 G	29°F 2 weeks	none
Glenora *Mike Elliott*	20-21° Brix 0.90-.95 TA 3.05-3.1 pH	None	None	1% freeze-dried Montrachet 52-55°F	No	0	30°F 2 weeks	None
Meredyth *Archie Smith III*	Regular 21.5-23° Brix 0.65-0.85 TA 3.05-3.1 pH	None	None	1% freeze-dried Epernay 50-55°F	Yes American Oak 2,200 G	2 lb/ 1,000 G	26°F 4 weeks	American Oak 10 months
	Reserve 22.5-23.5° Brix 0.65-0.85 TA 3.1-3.2 pH	None	None	1% freeze-dried Epernay 45-50°F	Yes American Oak 50 G	2 lb/ 1,000 G	None	American Oak 4 months
Montbray *H. Mowbray*	18-20° Brix 0.7-0.9 TA	None	None	1% freeze-dried Montrachet 58-62°F	Yes American Oak	300 gr/ 125 G	Natural 30°F 4 weeks	American 130 Gal Sherry Butts
Mt. Pleasant *Paul Burdick*	19-20° Brix 0.85-0.95 TA 3.1-3.2 pH	None	9% Vidal	1 kg/1,000 G freeze-dried Epernay II 60°F	No	1 lb/ 1,000 G	Natural 30-35°F 2-4 weeks	None
Naylor *Dick Naylor*	19-21.5° Brix 0.75-0.9 TA 3.15-3.35 pH	Yes 6-8 hrs	None	freeze-dried Champagne 505 55-60°F	No	Minimum	Natural	2/3 American 1/3 Limousin 4 months
Nissley *Richard Nissley*	18.4-19° Brix 0.95-1.13 TA 3.08-3.22 pH	None	None	3-10% liquid Epernay 50-60°F	No	0	Natural 28-30°F 4 weeks	None
Rolling Vineyards *Ed Grow*	21.5-24° Brix 0.9-1.2 TA	Yes 2-4 hrs	None	1% freeze-dried Epernay 55-65°F	No	1-2 lbs/ 1,000 G	Natural 26°F 2 weeks	None
St. Julian *Chas. Catherman*	18-21° Brix 0.85-1.0 TA 3.1-3.3 pH	Yes 3 hrs	None	1% freeze-dried Epernay 55°F	No	0	26°F 3 weeks	None
Wickham *Bill Lamberton*	21.5-23° Brix 0.85-1.0 TA 3.0-3.1 pH	None	8% Cayuga	2% freeze-dried Champagne 595 55°F	No	Minimum	30°F 2 weeks	None

TASTING NOTES

Paul R. Burdick, *Mt. Pleasant Wine Co., MO*
Jack Foster, *Cedar Hill Wine Co., OH*
Dana Keeler, *Herman J. Wiemer Vineyard, NY*
G. Hamilton Mowbray, *Montbray Wine Cellars, MD*
Dick Naylor, *Naylor Wine Cellars, PA*
Don Neel, *PRACTICAL WINERY*
Gene Pierce, *Glenora Wine Cellars, NY*
Steve Reeder, *Penn Shore Vineyards, PA*
Susan Smith, *Meredyth Vineyards, VA*
Bill Worthy, *Grand River Vineyards, OH*
Tom Wykoff, *Cedar Hill Wine Co., OH*

(Winemakers interviewed were invited to submit a sample of 1982 Seyval—or if not released in time, the 1981. Wines are listed in the order they were tasted and discussed.)

Nissley Vineyards, Pennsylvania

Comments before the unveiling:

Wykoff: I thought it was oxidized.

Mowbray: I agree, slightly oxidized.

Neel: By the color, you can tell that there is something different about it when compared to the other wines in this flight.

Mowbray: When you get underneath the oxidation, it did not have any Seyval character.

Burdick: I did find quite a bit of appley character underneath the oxidation.

Reeder: I think it was stored in old cooperage or barrels that had a mold infection at one time. Everyone else is calling it oxidation. I'm not sure about that. It has a character that I've smelled in old wooden cooperage before.

Color/Aroma: Dark straw to golden-brown, honey color. Slightly oxidized appley nose with hint of old cooperage.

Flavors: Forward tartness with dry, citrusy aftertaste.

Balance/Finish: Lacking varietal distinction, acid out of balance on high side, thin body.

Glenora Wine Cellars, New York

Comments before the unveiling:

Foster: One of the best. Definitely recognizable as Seyval with good oak and fruit in the background. Nice, full mouth.

Wykoff: Excellent German style wine. However, I do not feel that it will age well. It will hold up for 1-2 years.

Pierce: What do you consider a long-lived Seyval?

Wykoff: 10 years plus.

Keeler: We're seeing stylistic differences among these wines. I'm sticking my neck out to say that I think this is a Finger Lakes wine. It is typical of what we can do there.

Pierce: I agree.

Mowbray: It had a slightly off-odor.

Reeder: It's a wine that opened up more with time.

Comments after the unveiling:

Neel: 6% Cayuga is blended in, is there a reason or is this a style?

Pierce: Not really. We picked Cayuga out of the same vineyard at the same time. We have noticed though, that a small percentage of a blending grape like Cayuga or Vidal, tends to pick-up the nose. It gives a spiciness that we like.

Wykoff: Good, crisp, dry German style wine. I think that this is what's coming out of the Finger Lakes. We're seeing a pattern set.

Color/Aroma: Pale straw, ripe cheese, oak with good fruit, somewhat grassy, apple-pear.

Flavors: vanilla-oak, detectable residual sugar, apples, citrus, soft herbal, youthful.

Balance/Finish: Dry German style, good acid and fruit balance with lingering finish, pleasant green apple character.

Mt. Pleasant Wine Company, Missouri

Comments before the unveiling:

Naylor: A little sulfur in the nose.

Wykoff: I'd say mercaptans—I'm not faulting it. I wrote in my notes: not unlike French Burgundies.

Pierce: Exactly.

Wykoff: Much complexity.

Mowbray: Good oak in it.

Wykoff: It will age well. It's just a little high in acid.

Mowbray: Good malolactic finish with lingering acidity.

Reeder: Hot finish, possibly due to high alcohol.

Keeler: A second style of Seyval. It's seen wood, gone through malolactic, lost some crisp fruit but gained complexity. Totally different than Finger Lakes style.

Wykoff: Fruit and oak balance is there. Maybe too young to really evaluate at this time.

Comments after the unveiling:

Burdick: I find many of these comments interesting. Most of all, it did not undergo malolactic and it did not have any wood.

Wykoff: John Parducci did that to me once!

Neel: Parducci has fooled me like that several times.

Burdick: This is my first hybrid wine. There are many aspects of this grape

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with which I am unfamiliar, one of them being that this wine has done a 180° change since it was bottled seven months ago. At bottling, it was herbaceous, grassy and austere. It was meant to be tart to complement food. It is now Burgundian, developing this on its own without wood contact. I don't know if this would happen with grapes coming from vineyards in other regions.

Mowbray: I think it would. There's always a kind of woody flavor complement to Seyval.

Burdick: High alcohol was mentioned. I believe that this is due to Epernay II yeast. It is very efficient in conversion of sugar to alcohol, more along the lines of 0.6 as opposed to 0.5. I've seen this in California Chardonnays where it does the same thing. Another interesting thing I'd like to mention about this wine is that it was made entirely from a second crop. We lost the primary buds to a late spring frost. We picked less than one ton/acre.

Color/Aroma: Straw, intense green-gold color. Some sulfur, heavy fruit seems to be masked, smokey, yeasty, grassy.

Flavors: Complex, oak and fruit, slightly hot, good mouth feel.

Balance/Finish: Slightly high acidity, very dry, slightly hot finish, good body, long finish. Finishes like a French Burgundy.

Boordy Vineyards, Maryland

Comments before the unveiling:

Keeler: I'm suggesting that this wine went into oak, even though we got burned on the previous wine. It's not really showing in the taste but I pick up vanillins in the nose. It's an alternate to the Finger Lakes style. Alcohol is slightly out of phase with the wine right now. There's some hints of green olive in it also.

Reeder: Finish was short and flat.

Wykoff: My only objection to the wine is a short finish. I think it will age well. It's a complex and rich wine.

Keeler: Did anyone detect anything that would indicate a warmer fermentation? I picked up a taste in the finish that I usually attribute to a fermentation that gets a little on the hot side.

Mowbray: There's a bitterness and something in the nose that is medicinal. Overall, it has good varietal character.

Burdick: I think the taste is related to style and skin contact time.

Neel: To answer that question, the winemaker's notes say no skin contact time, and a fermentation temperature peak of 65°F.

Comments after the unveiling:

Naylor: Boordy gets some of his grapes from sandy soil vineyard on Maryland's east shore. This may contribute to the differences that have been noticed. He's using a water hose down the middle of the tank to control fermentation temperatures.

Color/Aroma: Straw, correct for variety. Clean, typically varietal, apples and vanilla, oak fades away.

Flavors: Complex, rich, glycerine, licorice, old wood, full-bodied with a bit heavy oak, somewhat hot in mouth, Chardonnay-like, buttery, green olives.

Balance/Finish: Well balanced, mouth-filling, short finish, slightly astringent, flat finish, low acid, high pH, light body, oak dominating, dry Macon style.

Fenn Valley Vineyards, Michigan

Comments before the unveiling:

Wykoff: A German wine in a French style.

Naylor: Young, green nose almost like a brand new wine. Steely, acid character.

Reeder: That character comes in after treatment with cadmium sulfate. It's an alka-seltzer after-taste. I detected a mercaptans character that has been treated—a metallic character that a wine takes on after using cadmium sulfate.

Keeler: I wonder if it's 100% Seyval. I picked up a citrusy style and pineapple nose that indicates blending with Ravat.

Neel: It is 100% Seyval according to the winemaker's notes.

Wykoff: This wine would have benefited from a malolactic and some wood because I got a short flavor. Malolactic with this grape adds roundness, complexity and a better finish.

Mowbray: I disagree. I think it has good balance with crisp finish. It's varietal with true fruit.

Burdick: Intense fruit, indicative of a cold fermentation. Very good in this particular style. A wine that I would associate with Chenin Blanc.

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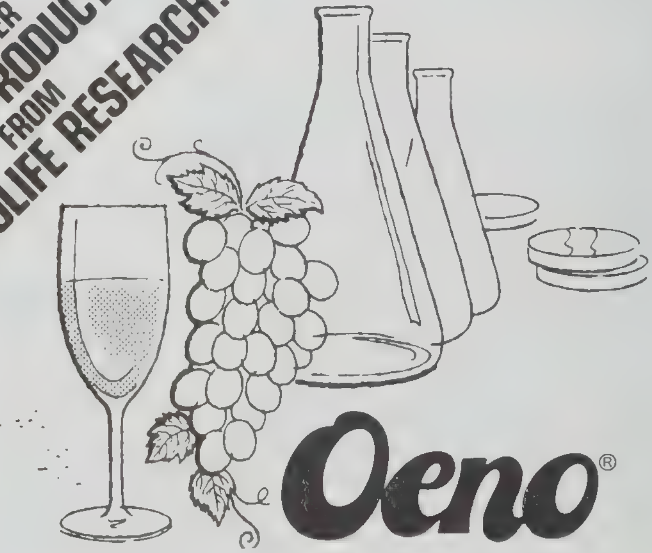

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Comments after the unveiling:

Neel: I find Wykoff's comments interesting because the grapes came in at 0.98 TA and 3.2 pH so the potential for ML was there. I don't think that it is in Doug Welsch's perspective to do that but certainly by the grape, it may have been possible.

Reeder: I feel that this wine has been worked on.

Neel: According to the winemaker's notes, Acidex was used to reduce the TA to 0.87.

Color/Aroma: Light, pale straw, clean and green, typical for young Seyval. True fruit, good varietal distinction, sulfury, big fruity nose, appley, pineapples.

Flavors: Mouth-filling, soft yet astringent and lemony, sulfury, grapefruit, complex citrus flavors, varietal flavors pleasantly pronounced.

Balance/Finish: Good body, shallow foretaste, pleasant lingering finish, well-balanced with crisp finish, somewhat steely, acidity complements residual sugar for drinkability.

Rolling Vineyards Farm Winery, New York

Comments before the unveiling:

Foster: Clean Seyval character. Fast finish, low acid.

Reeder: That's exactly what I noted. Lemony, fruity Seyval nose. Pleasant wine that leaves quick.

Naylor: With a bit more acid, it would be superb. Good extract. Soft in the mouth.

Neel: I don't understand this, it is a Finger Lakes wine that came in at 23° Brix?

Pierce: It happens.

Neel: Hopefully by plan.

Pierce: We brought in our 1980 Spring Ledge at 23.5° Brix because of higher night temperatures. The grapes were in great shape. We oaked the wine that year.

Reeder: It can be done. It just depends year-to-year.

Wykoff: Our biggest problem at harvest is counting on rain. We run into the China syndrome – what we call 'sweet and sour', particularly if we're in the 23° range.

Naylor: The wine will appeal to a great number of consumers. If I were picking a wine for the market place, I'd pick this one.

Color/Aroma: Lemon color, straw, green-gold, yellow-gold. Good fruit and wood complexity, lemony, sulfurous, yeasty, buttery- cheese.

Flavors: Woody and complex, full, rich, smooth, honeyed, soft, good extracts, round, residual sugar slightly high.

Balance/Finish: Full and smooth, pleasant entry but leaves quickly, a bit more acid would make this wine excellent, slightly heavy to sweet finish, residual sugar without acid balance.

St. Julian Wine Company, Michigan

Comments before the unveiling:

Wykoff: Sugar overpowers acid. Will be short-lived. Good acceptance by public as a young wine.

Reeder: I don't know about that. Shows a little bit of honeyed fruit but fruit is masked by sorbate.

Worthy: There's some apricot quality.

Wykoff: I think its a commercially acceptable and consumer appealing wine.

Mowbray: There's a whole segment of the market out there that wants wines like this.

Naylor: That's right, but this wine had a manufactured quality like you did not make it from grapes.

Color/Aroma: Pale straw, good standard varietal color. Apples, characteristically varietal, rich, cheesey, fruity, apricots.

Flavors: Simple but true, slightly sweet, apricots, very sweet.

Balance/Finish: Sugar overpowers acid, a pleasant lingering finish for a Riesling, but not Seyval; mouth-filling, weak finish.

Cedar Hill Wine Company, Ohio

Comments before the unveiling:

Wykoff: This is what I was referring to earlier when I discussed over-ripe Seyval in our district. The 'sweet and sour' funk from over-ripe fruit. It is Burgundian in style but the alcohol is quite high.

Naylor: It sure tastes like Limousin oak.

Wykoff: I suspect that this wine came out of the Lake Erie appellation. I'm not faulting the wine. It's just the style.

Naylor: Acid is a bit low.

Comments after the unveiling:

Neel: Naylor and I detected Limousin oak, but it was barrel-fermented in decharred whiskey barrels, what did you do?

Foster: After barrel fermentation in new decharred whiskey barrels, we put a blend of different barrels into two-year-old Yugoslavian puncheons and aged the wine there for three months.

Burdick: Why did you choose to ferment in decharred whiskey barrels?

Wykoff: It's called economics.

Foster: Virtually no oak flavors come from the whiskey barrels. That's why we later put wine into European cooperage.

Color/Aroma: Full and ripe, yellow-green, more yellow than expected Seyval color, deep golden, too dark. Over-ripe fruit, sweet-and-sour, vegy, slightly woody, appley, oaky, buttery.

Flavors: Blown out, appley, good fruit but overoaked, alcohol is nicely complexed with wood, good fruit showing underneath, barrel fermentation and Limousin character.

Balance/Finish: Low acid, slight bite, somewhat flabby, moderately long with good balance.

Wickham Vineyards, New York

Comments before the unveiling:

Worthy: Not varietal. I'd bet my bottom dollar that there's some Ravat in it.

Mowbray: Slightly varietal but not heavy.

Keeler: I picked up the pineapple that I associate with Ravat but I like Seyval with this blend.

Smith: Off in the nose.

Naylor: Agreed. I'd pick this one as coming from Pennsylvania or further south in Maryland or Virginia. The nose blew off later, however.

Wykoff: Very young at this point. It should improve with age.

Foster: Smooth finish.

Comments after the unveiling:

Worthy: He used how much non-varietal?

Neel: 8% Cayuga. The winemaker's notes also report very limited oak-ageing.

Pierce: Right, but those were all new Bluegrass barrels, if I'm not mistaken. I'm certain that there is no botrytis also.

Wykoff: I've had the same thing happen with new Bluegrass. After 3-4 years of use, you begin to get the best quality from those barrels.

Pierce: Agreed.

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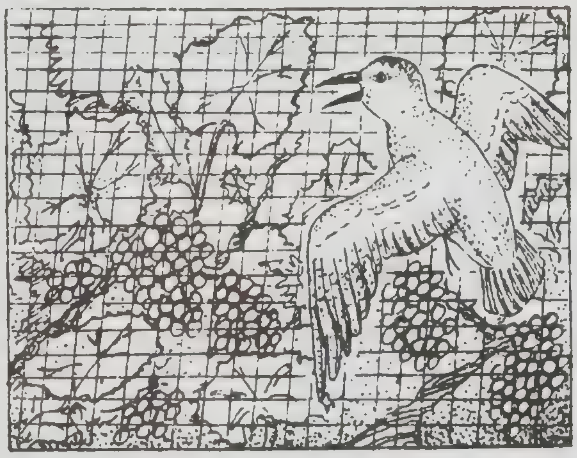

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Color/Aroma: Deep, yellow-gold. Green olive, ripe fruit, pineapple, definite Seyval fruit, complex.

Flavors: Complex Sauterne style, pineapple and apricots, good extracts, truly Seyval, fruit and oak.

Balance/Finish: Excellent acid balance, medium body with smooth finish, finishes long with good fruit holding, rich and full, some bitterness.

Naylor Wine Cellars, Pennsylvania

Comments before the unveiling:

Wykoff: Tank smell and taste which I associate with filter pad off-flavor.

Worthy: Plainly medicinal.

Mowbray: I call it ethyl acetate.

Wykoff: This is not an oxidative problem. It's the pads.

Worthy: Reminds me of Sauvignon Blanc.

Comments after the unveiling:

Burdick: The dangers of tasting with winemakers!

Color/Aroma: Pale straw with light green highlights. Some wood, little or no fruit, some Labrusca nose, vanilla.

Flavors: Older oak, moldy barrel, somewhat flat but good body, tart, buttery, nutty, intense, full.

Balance/Finish: Thin, moderately long with slight sweetness, unbalanced, low acidty, peppery finish.

Meredyth Vineyard - Special Reserve, Virginia

Comments before the unveiling:

Foster: I got distinctive barley.

Mowbray: Agreed—grain.

Keeler: Good oak.

Comments after the unveiling:

Burdick: I thought this was American oak. It's a very interesting and well-made wine. It's showing a lot of oak right now but it will yield nicely to fruit in time.

Smith: We use small American white oak.

Keeler: I thought the acid was a little low but it was saved by the tannin and the alcohol level. The tannin helped offset a low acid. It's nicely balanced because of other components, not the usual acid-sugar balance.

Burdick: I'd like to ask the other winemakers what they feel this particular bouquet is coming from. It does not come across as Seyval to me.

Wykoff: It's regionally varietal.

Mowbray: Exactly.

Smith: This is distinctly different from any Seyval we've ever made. The 1982 Seyval is just different.

Color/Aroma: Straw. Pungent varietal nose that yields to oak, good varietal characteristics, herbal.

Flavors: Oak with lasting barley, American oak, good ripe fruit, mouthfilling complexity, coconuts.

Balance/Finish: Well-balanced, tannins and wood offset low acidity, good food wine.

Meredyth Vineyard - Regular Bottling, Virginia

Comments before the unveiling:

Foster: Beautiful Seyval fruit balance. Flavor is balanced with oak. Long finish, full mouth.

Wykoff: Excellent food wine. It's in its infancy now and will improve with age.

Burdick: It has a character that I've personally associated with Seyval: grassy and reminiscent of Sauvignon Blanc, just a bit lighter perhaps. Exceptional fruit balance. Too many eastern wines do not have a mouth-filling texture. This wine has a good mouth feel.

Pierce: This is my favorite wine.

Wykoff: Mine too!

Color/Aroma: Straw. Grassy, ripe varietal character with some oak, oaky, apple, honey, cheesy, muted fruit.

Flavors: Well-balanced fruit with oak, vanilla. American oak closes down on fruit, good extracts, rich varietal character, woody.

Balance/Finish: Mouth-filling, long finish, slight bite, lingering fruit finish, well-balanced.

Montbray Wine Cellars, Maryland

Comments before the unveiling:

Naylor: I picked up Nevers oak in the background—a tobacco taste came through. I always associate this with Nevers cooperage. It was a little overpowering. This wine, in its style, might be tough to sell.

Wykoff: A bitterness that I did not like.

Pierce: Sharp.

Comments after the unveiling:

Mowbray: I use only American oak.

Keeler: Could you comment on the 1981 vintage since this is an '81 wine. Given our Finger Lakes conditions that year, this wine does not show itself badly.

Mowbray: It was not a good year. I think that's its weakness in character. This is also a blend of grapes from six different vineyards. Some were as old as four years and others up to seven.

Color/Aroma: Bright yellow-gold, too dark. Toasty, musty, some oak, Nevers, tobacco.

Flavors: Woody, much oak and no fruit, woody and soft, spicey, tobacco, wood!, intense butteryness.

Balance/Finish: Long finish that is all oak, some lack of acidity, somewhat flat, overpowering oak, big and full, some bitterness.

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GRAPE MATURITY

continued from p.25

take about 200 tons from each ranch. It's very difficult to assess maturity of Zinfandel because there can be a 10° Brix range in sugar in one cluster. This was obvious at Monte Rosso in 1983. We thought we had the fruit just right at 22° Brix, 0.95-1.0 TA and 3.1 pH, but ended up with 15% alcohol. I use a method my father taught me to help in assessing maturity of Zinfandel. You take a cluster and squeeze it. If the juice runs red, it's ready to pick. Monte Rosso vines yield three tons/acre and the fruit has a distinct peppery character with a heavy astringency.

Chiles Valley is just the opposite. These vines are on deeper, richer soils and yield up to eight tons/acre and this fruit doesn't seem to ripen beyond 21° Brix and only gives 11% alcohol. We pick it at 19.5° Brix, but the must is usually 21° Brix, 0.9-0.95 TA and 2.9-3.0 pH. The vines are spur-pruned to bilateral cordons with eight spurs/arm. We get 100% budburst and can get second, third and even fourth crop if we don't crop-thin at the right time. Fruit from this Chiles Valley vineyard makes a light wine with an almost green character. But when we put it with the Monte Rosso wine the result is excellent. The alcohol is 12.5- 13%, tannin blanace is good and there is a raspberry character to the wine. The two really complement each other.

There is some variation in the fruit we get from our Merlot vines at Los Vinedos del Rio. The vines on the bottom are the largest because they're in the deepest, richest soil. Fruit set is a problem because high nitrogen levels in the soil cause flower shatter and therefore reduce set. Initially, the vines look like they will give 6-7 tons/acre. But after the reduced set, we end up with only four. We generally pick this fruit at 22° Brix, 0.75 TA and 3.4 pH staring about two weeks after we pick fruit from the middle level. This is what I call our mass production fruit. Vines on higher ground give us our best fruit. They are on a thinner soil with more gravel in it and only yield three tons/acre. But the fruit composition is slightly better at 22- 22.5° Brix, 0.85 TA and 3.3 pH. Vines even further up the hill are picked last and usually have a composition of 21.5° Brix, 0.75 TA and 3.4 pH.

Fruit we get from the Carpenter Ranch on the Silverado Trail near Lodi Lane has a soft Cabernet Sauvignon character. A sort of blackberry-cherry with some herbaceousness. We pick it in mid- October at about 22.5° Brix, 0.75-0.85 TA and 3.2-3.3 pH. The soils have a lot of rock in them and the vines usually show signs of chlorosis by the time picking begins.

We also have ten acres of Merlot behind our St. Helena winery. We pick these vines in mid-September. Taste is my main criterion for determining maturity in this young vineyard because the cropping levels have varied considerably. This fruit has a really fantastic balance of flavor, and a tremendous tannin structure. In 1983, I picked it when the fruit had gone from blue to 75% black. The skins were firm and the berries hadn't really softened yet, but the sugar was just where I like it at 22.5° Brix. The pH was 3.2 and the TA 0.7.

60% of our Merlot comes from the Carinalli/Hunter Ranch in Alexander Valley. These are big vines and yield about six tons/acre. We start picking about the third week in September and the fruit usually comes in at 22-23° Brix, 0.7 TA and 3.5-3.6 pH. It has a very grassy herbacous character which I find overbearing because the berry character isn't there to balance it out. I'm having some success in vinification experiments to reduce the grassy character of these grapes but am not ready to say that I've found the answer yet.

We get Pinot Noir from three ranches: Las Amigas, La Loma, and Hailey Ranch which is on the south side of Rutherford Crossroad, 1/2 mile from Silverado Trail. I like to get the fruit at an average of 22° Brix, but at Hailey Ranch acid is a problem at this sugar level. (it is usually only 0.6-0.65 with 20% malic and 3.4-3.5 pH.) There is quite a range in maturity in this vineyard due to rich soils above and gravelly soils below. Sometimes we have to wait an extra week before picking the bottom to get consistency across the whole vineyard.

Picking usually starts in mid-September at Las Amigas. Fruit from these 15-20 year-old vines usually comes in at 23-23.5° Brix, 0.95-1.0 TA and 3.2 pH. It makes a powerful, well-structured wine with a tea-like spiciness and a sweet estery aroma. Picking at La Loma doesn't usually start until mid-October with fruit composition at 22-22.5° Brix, 3.3-3.4 pH and 0.75 TA. 30% of the TA is malic but I still acid-adjust this juice before fermentation. Wine from this fruit has a real elegance, not the robustness of wine from the Las Amigas fruit which has a bit more of a carmelized character, sometimes even a little pruney. It's good for blending but doesn't really stand up on its own.

We have Napa Gamay at Hane's Ranch, in St. Helena, where we get very good fruit with tremendous pigment at 22.5-23° Brix. We also have it at Healdsburg which seems to be the wrong place. The fruit never seems to get beyond 19.5° Brix with 0.95 TA and 3.1 pH. It smells and tastes like diesel oil, not what you would expect from Gamay. The vines

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were planted in '62-'63 and have a lot of disease but still yield 6-8 tons/acre. Our best Gamay comes from Monte Rosso where we have Napa Gamay planted. This is picked at around 23° Brix, 1.0 TA and 3.0-3.1 pH. We get plump berries with hardly any raisining, very good color and the fruit has a clean, very berry-like taste with none of the diesel oil character.

We begin picking Petite Sirah near St. Helena High School about the first week of September. The fruit is usually 23-25° Brix, 0.85-0.9 TA and 3.2 pH. It makes a very big wine with 14% alcohol. It's very astringent, with dark color, deep heavy tannin and a peppery almost liqueur-like spiciness. We also have Petite Sirah at Chiles Valley where we begin picking in early to mid- October. The fruit is usually at 21.5-22.5° Brix, 0.65 TA and 3.4 pH and makes a softer wine of 12-12.5% alcohol. These are very healthy vines with heavy foliage, large tight clusters and generally yield 5-6 tons/acre.

Finally, we have some Barbera planted at Monte Rosso which is picked in early-mid October. This fruit usually cones in at 23° Brix, 1.2 TA and 3.0-3.1 pH. We only use this for blending as Barbera doesn't make a good wine on its own.

Paul Masson Vineyards, CA

PW: How do you determine grape maturity?

Larry Brink: Fruit appearance is a major concern because our location and climate enhance mold development. We also follow the changes in Brix, TA and pH and flavor during the ripening season. The Salinas Valley is different than other viticultural areas of California mainly due to the unique, coastal-influenced climate. Our main ranches are Pinnacles at Soledad, Greenfield and Las Colinas at San Lucas (10 miles below King City and 40 miles south of Chular) which total 3,500 acres.

With each vintage, the fruit condition varies because of different weather conditions in each area. Fog is one of the main influences. If it lasts most of the morning and comes back in the early afternoon, botrytis development is enhanced due to the dampness. When rain follows these foggy periods you can't wait for optimum numbers and flavors, you have to get the fruit in.

The Monterey bell pepper character used to be a problem but with the vineyard's older age and improved viticultural practices (the area has been producing grapes for only 20 years) we have pretty much eliminated the problems. We've experimented with irrigation timing—finishing in mid-July so there is no shoot elongation during ripening. This is to help direct the flow of carbohydrates to the fruit instead of to lengthening shoot-tips. I'd like to see the vines appear slightly stressed right around harvest time.

We're also experimenting with hedging and other canopy management techniques to improve air circulation around the bunches in vigorous varieties like Sauvignon Blanc and Semillon. A combination of reducing irrigation before ripening and canopy management for fruit exposure helps diminish the excessive varietal character. This isn't always possible because when vines in soil less than two feet deep are in a hot spell—they have to have water.

The strong grassy character is most pronounced at the beginning of ripening when the fruit is about 16° Brix. It becomes less evident as the fruit ripens past 20° Brix but is still there at harvest in some varieties. We have noticed that exposed fruit has less of the bell pepper character than shaded fruit. So our canopy management practices enhance this exposure.

However, due to flavor and pH problems we don't grow Cabernet Sauvignon, Pinot Noir or Zinfandel for varietal wines in this region, we use fruit from Sonoma County. All of our white wine varietals carry Monterey appellation.

PW: Can you give us your impressions of maturity changes, including flavor, of Cabernet Sauvignon during ripening?

Phil Franscioni: At 16° Brix, the grape displays a real grassy, tart malic acid character. As it matures, the acid levels off. However, the fruit still has an excessive varietal character. With further maturity, the flavors and aromas harmonize into a pleasant balance of fruit and varietal characteristics. This is usually around 22° Brix.

LB: Over the years we've been here (since 1962) we've found that Cabernet Sauvignon does best in the warmer areas south of King City. Fruit from our Pinnacles Ranch always seemed to have more intense varietal character than fruit from Greenfield which is only 10 miles south, but is warmer. Of course there are exceptions to this when micro-climates in certain areas favor production of Cabernet. For example, the bench area just west of the winery at Soledad produces a nice Cabernet Sauvignon.

Sauvignon Blanc and Semillon have similar ripening patterns. At 16° Brix they both have a green agressive acid and pronounced grassy character. As with Cabernet Sauvignon, we need good water mangement to slow down vine growth and promote fruit maturation.

I use cluster sampling for all the varieties, sampling about every fifth vine in each sample row. I taste the fruit and chew the skins as I go to see what is happening to the flavors.

We harvested Sauvignon Blanc on Oct. 11 and the fruit was at 21.5° Brix, 0.95 TA and 3.33 pH. There was only a hint of bell pepper character, but a lot of the typical grassiness. Our only Sauvignon Blanc is at Soledad, but we have Semillon at both Soledad and Greenfield so we can compare

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maturities. At Greenfield in 1983 the fruit was at 19-19.5° Brix, 0.8 TA and 3.25 pH when we picked it. There was a nice grassiness with very little bell pepper. In fact we put some of this into our 1983 Estate Fume Blanc.

We let the fruit at Soledad get a little riper and picked at 21° Brix, 0.8 TA and 3.38 pH. Even though this fruit was riper, it had more of the bell pepper character than fruit from Greenfield. It might have been better with another week on the vines, but we had to get the fruit in after those late September rains. The fruit was only at 17° Brix with pronounced bell pepper character when it rained. By October 8, it was 20.6° Brix, 0.85 TA and 3.32 pH. Three days later it seemed to be dehydrating so we began picking it.

LB: You can make both styles of Cabernet Sauvignon or Sauvignon Blanc here. It's easy to accentuate that bell pepper character as it is a natural characteristic. But by growing these varieties in the right part of the valley and controlling the irrigation and the vine canopies, you can virtually eliminate the bell pepper and enhance the natural fruit characteristics of these varieties.

Now that we have Cabernet Sauvignon at San Lucas and are growing it right, wines made from this fruit no longer have that distinctive character. Similarly, our first Fume Blancs in the mid to late '70's had a really aggressive bell pepper character that some people seemed to like. We have since changed our style of Fume. We changed our viticultural and enological practices to tone down this character and make softer, more balanced wines.

Flavor is the most important maturity parameter for Gewurztraminer. We always pick on flavor and adjust for acid and pH. I can really notice the spiciness developing over the time I sample. It develops very quickly and peaks at about 22-23° Brix. Unfortunately, the pH is usually at least 3.6 at this stage so we have to adjust it down to 3.4 with tartaric acid before fermentation.

LB: We grow Gewurztraminer at Soledad and Greenfield but prefer the fruit from Soledad because of its distinct spicy character. pH changes so rapidly in this variety that you should really pick it the same day you sample to get it right.

PF: We have a vineyardist who samples all the varieties once a week. Then as the fruit is approaching maturity, I sample them every few days. In 1983, I sampled the Gewurztraminer at Soledad on September 12, 17, and 19 and we picked on September 20. The average fruit composition was 21.8° Brix, 0.85 TA and 3.7 pH. That pH was higher than usual. We picked Gewurztraminer on September 21 at Greenfield in 1983 with an average fruit composition of 22.5° Brix, 0.7 TA and 3.75 pH.

Flora is similar to Gewurztraminer but doesn't get as spicy. It actually has a floral characteristic. It's a real grower's grape. The skins are thicker so it isn't as susceptible to mildew, mold and insects as Gewurztraminer. We concentrate mainly on the numbers when deciding when to pick this variety. It goes into our blending program so we're after balance as well as some varietal character. At harvest the fruit is usually close to 20-21° Brix, 0.9 TA and 3.3 pH.

We watch the numbers (mainly pH) closely on Sylvaner (Franken Riesling) because it can go from 3.3-3.7 in two days. So when the pH is getting close to 3.3, it't time to start picking. In 1983, the fruit was 19-19.5° Brix, 0.9-0.75 TA and 3.3-3.4 pH when we picked it.

PF: Botrytis and secondary rots are the main problems with Johannisberg Riesling. I would like to get 21° Brix, 1.0 TA and 3.1 pH, but ended up with 28° Brix in 1982. Fortunately, this was dehydration due to Botrytis so there was no

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moldy character to the wine. There was just a nice, light Botrytis character.

LB: Every year in the north end of the valley you fight Botrytis and bunch rot. Although Soledad is a windy area, when the fog hangs in for most of the morning, bunch rot can be a real problem. There is too much risk of getting secondary rots to let botrytis develop on the fruit. Mold is really the biggest problem in northern Monterey County.

PF: 1983 was a good example. Our Riesling was at 19.2° Brix, 1.0 TA and 3.08 pH on September 26, the day before rain came. We began harvesting on the 27th, but couldn't get out to finish until October 3. But that fruit composition was 18.6° Brix, 0.84 TA and 3.19 pH. Our experience with rain-affected fruit has taught us the operative words: 'DO NOT DELAY'. So we got fruit off in time.

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Chenin Blanc is another variety that develops a very nice fruity-melon character when the fruit gets up to 20-21° Brix with 1.0 TA and 3.1-3.2 pH in late September or early October. Vines are spur-pruned on bilateral cordons with 16-18 spurs/vine and yield about 3 1/2 tons/acre at Pinnacles. Because of its tight clusters it must be watched closely after a rain for bunch rot.

LB: We use Pinot Blanc (Melon) as part of our cuvee program with Chardonnay and Pinot Noir. It is relatively neutral in flavor but adds body and fullness in the mouth.

PF: I sampled this on September 13 in 1983 and the fruit was at 18.2° Brix, 1.3 TA and 3.0 pH. Then there was a hot spell and by the time we harvested it on the 17th, the fruit was at 19.2° Brix, 0.94 TA and 3.2 pH. We would prefer a TA of 1.1 and pH of 3.0-3.1.

LB: We crush Chardonnay from San Lucas to Chular so we have a range of fruit characteristics. Fruit from Chular goes into the cuvee program, and the rest goes into our varietal wine.

PF: We usually pick at Chular in mid to late September and get an average fruit composition of 18° Brix, 1.1-1.2 TA and 3.0-3.1 pH. The vines yield about three tons/acre.

LB: We also take fruit from Soledad for the cuvee program. In 1983, we were picking at both ranches from September 19-30 and the average fruit composition was essentially the same. We picked fruit for our varietal wine on October 1-10 at San Lucas when the fruit was at 21-22.5° Brix, 0.9-0.7 TA and 3.3-3.5 pH.

Vince Bonotto: These soils were poorly drained and our yields were only about three tons/acre. Then after the 1981 harvest we ripped the ground between every second row to break-up the hard pan and the vines responded. We now get almost four tons/acre with the same fruit quality.

LB: Fruit at Greenfield had a composition of 21-22° Brix. 0.8-0.9 TA and 3.3-3.5 pH when we picked it on October 10-12, 1983. Fruit at Soledad had about the same composition and was picked at the same time (October 6-12). But I think the Greenfield area is best for this variety. The fruit can give a nice appley but full, high-extract character to the wine. In general, Chardonnay from the Salinas Valley at 20-21° Brix has a light citrus-like character. When it is close to 23° Brix, it takes on a full, appley, oily character.

PW: What fruit composition and maturity parameters do you look for in Emerald Riesling, Gamay Beaujolais, Petite Sirah, Pinot Noir, Souzao, and Zinfandel?

LB: We're looking for a sharp, grapefruit character in our Emerald Riesling so we pick it when the berries are still firm and green and when the acid level just begins to drop. But we always seem to be waiting for the grapes to reach this early stage of maturity. It is part of our blending program so we're mainly concerned with acid, pH and fruit character.

PF: This variety was developed for the Central Valley and needs hot conditions to ripen fully. It ripens very slowly here. It doesn't get close to ripening until the end of October because we have to prune it so late (early March). The late pruning is necessary to avoid conditions that favor dead-arm (Eutypa) because Emerald Riesling is very susceptible to this disease. The late pruning causes a late bud break which delays the whole growth cycle.

PW: Don't the vines compensate for the late pruning and ripen the fruit at about the same time they would if pruned earlier?

PF: Not completely. For example, it took us over two weeks to prune French Colombard in 1982 and the early-pruned vines ripened their fruit two weeks before the later-pruned vines.

LB: We always have to wait for Emerald Riesling to ripen. The main thing we're looking for is the drop in acid.

PF: We started picking in mid-October in 1983 when the fruit was 17.5° Brix, 2.95 pH and 1.4 TA. One week later, in mid-harvest, the fruit was at 18.5° Brix, 1.1 TA and 3.0 pH. By the end of October, the vines are really shutting down.

VB: We're mainly concerned with fruit appearance with Petite Sirah. I grew up around Lodi so I know this variety and I've never seen it get past 22° Brix without shrivelling and falling apart. If you pick it early to avoid the slight dehydration that begins at about 21-22° Brix, the fruit has less color and less of the distinctive peppery character than if you pick it just after it begins to dehydrate.

Yields for early-picked fruit range from 4 3/4 - 6 tons/acre. They're almost a ton less (4-5 tons/acre) for the mature fruit because of dehydration, but the fruit is much better. We usually harvest this variety in mid-October with an average of 20° Brix and with acid ranging from 1.0-0.7 and pH from 3.2-3.4. If you let it get past 22° Brix and the fruit doesn't fall apart, that clean peppery character turns to a pruney one and the wines have a cooked character.

LB: We have 331 acres of Zinfandel at San Lucas but due to its inherent problems (uneven ripening, shrivel, shot berries and second cropping) we pick it early. We use some for cuvee material but the bulk of it is used in our rose program. Only Zinfandel from Sonoma County is used for our varietal wines. But we believe that fruit from Salinas Valley is better for rose because it has more fruity character and less tannin.

VB: Zinfandel can produce very large clusters in this area. They can be over one-foot long and weigh 1½ lbs each. Usually the outside will be ripe and the inside will still be green.

PF: In 1983 we started picking at San Lucas on September 19 and the must composition was 14° Brix, 1.2 TA and 3.06 pH. We use fruit of this composition for our cuvee program because at this low sugar level the flavor is neutral. We finished picking on October 8 when the must composition was 19.6° Brix, 0.92 TA and 3.26 pH.

LB: Souzao is a two-way grape for us. In some years we make port from the fruit, but in most years we use it for coloring material. It has a very intense and stable color so it's good for color adjustments in various blends. I wouldn't recommend using Souzao from Monterey County for port because it needs 10-15 years of ageing before bottling. But Souzao from the Central Valley only needs 5-7 years of ageing.

PF: We have a ten-acre block of Souzao at Soledad that was planted as part of a variety suitability program. It is a small block near the winery and is generally picked in mid-October right after the Sauvignon Blanc. In 1983, we picked it at 21° Brix, 1.1 TA and 3.25 pH. Usually the vines are just beginning to shut down and the fruit is just beginning to dehydrate at this stage. But these grapes have thick skins so it's possible to leave them on the vines a little longer if necessary.

LB: We grow Gamay Beaujolais (a clone of Pinot Noir) at Chular, Soledad, Greenfied and San Lucas and use it mainly for cuvee. We also let some develop more maturity for use in our Beaujolais nouveau. We prevent malolactic for this so we can preserve the natural fruitiness of the variety. The fruit is picked in late August/early September for cuvee, then again in mid-late September for the Beaujolais nouveau.

We aim for a fruit composition of 17-18° Brix, 1.1-1.2 TA and 3.0-3.1 pH for the cuvee and 21-22° Brix, 0.9 TA and 3.2-3.3 pH for the Beaujolais. It was September 15 before we started picking the more mature fruit at San Lucas in 1983 and the fruit composition was 20.5° Brix, 0.95 TA and 3.3 pH. We didn't finish picking the Soledad vineyards until September 28 which was a little late as the average fruit composition indicates (22° Brix, 0.8 TA and 3.5 pH). 2,200 tons (most of our Pinot Noir) goes into the cuvee and rose programs. We grow it at the same locations as the Gamay Beaujolais and aim at the same composition when harvesting it for cuvee.

PF: Fruit from Chular has more color, a lighter flavor and ripens less evenly than fruit from further south. The cherry-like, ripe fruit character is most pronounced in fruit from San Lucas but the color is least intense in this fruit.

Ken Weber: These vines have up to four canes with 12-15 buds on each one and yield an average of four tons/acre. The fruit ripens early enough that there is no problem with bunch rot. The composition usually ranges from 17.5-20° Brix, 2.8-3.0 pH and 1.1-1.2 TA.

Robert Mondavi Winery, CA

PW: How do you determine grape maturity?

Phil Freese: I really have to divide my comments into what we've done in the past and what we will do in the future. Because we buy so many grapes and have to base these purchases on some measure of maturity, we have relied on sugar measurements. For example, in the years 1977-1980, when higher sugars were sought we also found that we achieved preferred wine quality when higher acid levels accompanied high (23-25° Brix) sugar levels and we paid bonuses for this combination of acid and sugar.

PW: Have you noticed that particular vineyard conditions contribute to certain varietal characteristics?

PF: Generally speaking, with Cabernet Sauvignon I've noticed that when vines appear to have excess vegetation, the vegetative fruit character is also present. There seems to be less of this character from vines with smaller canopies and better fruit exposure.

Bob Mueller: We have been buying grapes long enough to know (within our limited experience) the areas that produce the best fruit for our wines. For example, we prefer the Oakville area for Cabernet Sauvignon. The fruit tends to ripen later (mid-late October) than some other areas of Napa Valley, reaching 22-24° Brix late in the season. We get full, soft wines without harsh tannins. They have full berry fruit characteristics, not vegetative or over-ripe jammy characteristics.

Fruit from our Oak Knoll Vineyard (east of Yountville) tends to have more of an olive character and produces wines that are not as crisp or fresh as Oakville fruit. It is interesting that the vines at Oak Knoll have larger canopies and always appear greener than those at Oakville. As far as numbers go, in 1983 we were looking for 22-22.5° Brix in Cabernet Sauvignon. But in '81 and '82 we wanted 23-23.5°. Before that, we wanted 24° and paid bonuses for high acids (0.9-1.0). I don't want to emphasize the numbers too much because we've found that we don't always get what we want from the grapes even though the numbers are good.

PF: To me, vines that will produce the best Cabernet Sauvignon have stopped producing more new canopy about two weeks before veraison but are still green and maintaining a photosynthetic-active canopy. They are not stressed to the point of dropping their leaves but definitely moisture-stressed. The photosynthetic energy is going into the grapes, not into new shoot growth.

BM: Our window for Sauvignon Blanc in 1983 was 22.5-23° Brix with the actual: 22.6, 8.6 TA and 3.2 pH.

PF: I look at the fruit with this variety more than the vines. I'm looking for the stage when the fruit has lost that pea green opaqueness and is becoming translucent and slightly amber.

BM: We're looking at basically the same numbers for Pinot Noir and Chardonnay. Again, we like later-ripening fruit from cool areas like Carneros and south of Rutherford: 23.5-24° Brix, 0.8- 0.9 TA and 3.4-3.5 pH for Pinot Noir, and 23-23.5° Brix, 0.9-1.1 TA and 3.0-3.2 pH for Chardonnay. We prefer a wine that is full due to its complexity of fruit, acid and alcohol, not one that is just fat due to high alcohol levels. However, the numbers don't consistently indicate quality.

PW: How will you determine grape maturity in the future?

PF: We are measuring more than sugar, acid and pH now. We are looking at citric, malic, and tartaric acids on the HPLC. We're doing this to find parameters in addition to sugar, TA and pH that will tell us more about grape and wine quality.

This is a very technically-oriented winery and we are now establishing a data base in order to try to define quality parameters. We're recording the standard Brix, acid and pH as well as harvest dates, tonnages, and levels of amino acid-nitrogen and potassium. On an experimental basis, we are also recording color, tannin and malate/tartrate ratios for selected vineyard practices and their impact on fruit and wines.

We don't have the answer to the exact maturity standard since maturity of winegrapes, we feel, varies from season to season depending upon the weather in a growing season. We do recognize that sugar is very important since it yields the major fermentation product (ethanol) and is present in amount in wines second only to the water that comes from the grapes.

Our data collection is establishing a base to allow a reflection on the variances of the growing season(s) and material that allows us to build model ideas of the maturation process. Still the wine taste and perceptions are our guide. That guide has led us to earlier harvest dates which yield lower sugars and ethanols as well as better acids in the musts and better balanced wines with less intervention.

Robert Pepi Winery, CA

PW: How do you determine grape maturity?

Robert Pepi: There are many variables, but speaking very generally, Sauvignon Blanc starts to develop flavor around the first week in August around Yountville. This is the grassy, herbaceous character. Of course this varies with the season but the numbers are generally around 18° Brix, 1.0 TA and 3.0 pH. By mid-August, we're generally close to 20° Brix, 0.9-0.95 TA and 3.1-3.15 pH. That early greenness is just starting to diminish and some of that distinctive fruit character (each vineyard has its own distinctive fruit character) begins to appear — more of the floral, pineappley character and less of the grassiness.

We do have some vineyards that give a slight olive-like character but at this stage there is no grassiness. By harvest (late August-late September) the numbers are generally 20.5-21.5° Brix, 0.9 TA and 3.2 pH. Either the floral-pineapple or olive-like character, depending on the vineyard, is very apparent at this time.

PW: Can you describe some of the things that influence fruit character in different vineyards?

Rich Nagaoka (viticultural consultant to RPW): I think that vineyards with too much vegetative growth will give a pronounced herbaceous character in Sauvignon Blanc. The banana-fig character is more pronounced in fruit from young vines or vines with less vegetation and good fruit exposure. They have shallow root systems (less than three feet deep) and are not able to produce large canopies.

Fruit in this micro-climate (the environment immediately around the clusters) is in a high sunlight regime. After verasion the fruit takes on an amber-golden appearance. Analysis of the fruit often discloses slightly lower Brix and TA than green, shaded fruit, yet when you taste the fruit, the balance and flavor is pleasing to the palate. Similarly, pea-green Thompson Seedless table fruit to me is not nearly as flavorful as the straw yellow, amber fruit.

RP: We have Sauvignon Blanc on heavy soils in our vineyards but excessive vegetation is not a problem. It takes an extra month or more for our soils to warm up to 55-60°F, so our vines have proportionately less growth than those on lighter, better-drained, warmer soils. Our soils are so poorly-drained that the vine root systems are shallow, canopies are small and the vines look like they are growing in shallow soils on hillsides.

I could never get the intensity of fruit I wanted from Cabernet Sauvignon on these heavy cold soils. That rich berry flavor with a slight earthiness doesn't usually develop until the fruit is at 22-22.5° Brix. I would like to have 0.9 TA in the mature fruit because we've found that 50% of the TA in the fruit we get is malic acid. Half of this is lost in the malolactic fermentation and that's a big chunk of the total acidity. We usually get 0.75 TA with a pH of 3.5 when the fruit is mature.

Chardonnay doesn't generally develop the fruit character that we're after until the fruit is at 22-23° Brix, 0.8-0.9 TA and 3.2 pH and the berries have a golden appearance. 1982 was an atypical year. I think we'll see some nice fruity Napa Valley Chardonnays with relatively low alcohol because of the cooler weather conditions. This is a good example that you can't just go by the numbers. We picked at an average of 21.5° Brix and I think the varietal character is outstanding. We had to pick at the lower Brix, but the fruit was mature. I don't mean to minimize the numbers. We do have certain targets, but we've been here since 1966 so we have a good ideal of what numbers and fruit character we can get.

PW: Do you and your growers agree on your concepts of maturity?

RP: Yes. We work closely with them during pruning, pest control, and crop development. They don't mind waiting for us to tell them when to pick because we take all their fruit, even if we are wrong. I think that if the growers aren't concerned about producing the best quality grapes they can, they'll have a hard time selling them. We're out checking the vineyards from two months before harvest. I do all the sampling because I need to know the flavors as well as the Brix, TA and pH. Also, I'm responsible for the fruit because I tell them when to pick.

Schramsberg Vineyards, CA

PW: How do you determine grape maturity?

Greg Fowler: I use the numbers only as a guide in determining which areas are getting ripe first. The main things I look at are climate, age and yield of vines and juice flavor. We get different fruit flavor characteristics from each vineyard. We have to know these vineyards and what we expect to get from each one in order to make our blends. We're dealing with Chardonnay, Pinot Blanc, Pinot Noir and some Flora (Gewurztraminer X Semillon) and buy 80% of our fruit.

I'll use Chardonnay to illustrate the variation in fruit flavor characteristics we get from different vineyards. Fruit from the Eisele Vineyard in Calistoga has a very flowery, almost 'Gewurz' character which adds complexity to our final blend. Our own fruit, grown just south of Calistoga, makes a smooth peach-fruit style wine which is full in the mouth with a creamy texture — almost like biting into a peach. Our vines are on a shallow (six-inch) well-drained volcanic soil. Fruit from a nearby vineyard which is on red clay over clay-loam, gives a completely different wine. It is crisp, clean and has almost too much of that appley character. In general, fruit from the warmer St. Helena area does not have the varietal intensity as that from the Yountville-Napa area, probably because it is cooler down there.

One of the vineyards we buy fruit from has two clones of Chardonnay, the Beringer super-clone and the Martini clone. The yields are six and four tons/acre respectively at the same numbers but I think grapes from the Martini clone have a softer, less aggressive, more complex, flowery flavor. We make separate wines from each grower's grapes so both of

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us will know the special characteristics of these wines. This also helps us retain the special fruit characteristics as long as possible so we can make better blends.

My target window for Pinot Noir is 18-19° Brix, 0.9-1.1 TA and 3.0-3.2 pH. But there is an interesting vineyard effect on these numbers that shows up in fruit from our own and two adjacent vineyards in Yountville. In 1982, our fruit came in at 19° Brix, 0.87 TA and 3.07 pH. Fruit from one Yountville vineyard was 18.4° Brix, 1.3 TA and 3.03 pH and fruit from a second vineyard was 18.2° Brix, 1.11 TA, and 3.12 pH.

Our vines have leaf-roll but the others are similar, adjacent vineyards. We always pick the first Yountville vineyard before the other one and the numbers are always better on its fruit but we prefer wines from the other vineyard's grapes. That's why I think it's important to know the vineyards and what they can produce and not to rely solely on the numbers. For example, our best wines for Champagne come from our own grapes which are usually the lowest in TA!

Sebastiani Vineyards, CA

PW: How do you determine grape maturity?

Mary Sullivan: There is a lot of variation here from year to year in the growing seasons. What we are looking for in the fruit may occur at a different set of numbers (Brix, TA, etc.) (window) depending on the season. We monitor the numbers in the vineyard before harvest and we also sample every load of grapes delivered to the winery.

Speaking very generally, I would like to see Gewurztraminer at 22.5-23.5° Brix. This gives about 13% alcohol and makes a full-bodied wine, not a light fruity style. It is difficult to get acid levels with this variety at those sugar levels but we don't mind acid adjusting during winemaking. If we picked earlier to get the acid, we wouldn't be able to make the same style of wine. We do have one vineyard at Shellville, a cooler area, that produced good sugars and acid in 1983. Usually we like some Gewurztraminer from cooler areas because of the better acid levels.

Also, very generally, we like to see Chenin Blanc at 21-22° Brix. We can get a freshness and kind of grassy character from some of our vineyards at these sugar levels. We are bottling those wines to capture this character. Acid is not a problem with Chenin as it is with Gewurztraminer. We generally get about 0.8 TA, 3.4 pH and good flavor at harvest.

I've found that if you wait for higher sugar levels you lose that freshness and the flavor gets kind of blown out. Similarly, if you get it too much on the other side you get too much of a green fruit character. It's not balanced.

Green Hungarian is a variety that has real trouble reaching even 20° Brix. It needs a lot of heat early in the year – in June and July. If it's tagging along at 17.5-18° Brix and there is a hot spell in October, it's not going to help much. We're looking for a lighter-style wine, fruity but not as intense as our Chenin Blanc. Acid levels are only 0.65-0.7 TA.

Chardonnay varies most from vineyard to vineyard as far as different maturity levels are concerned. Generally we are looking for 22-24° Brix. We get all our fruit from the Sonoma Valley but are aware of the different characteristics of each vineyard. For instance, we have a vineyard south-east of the town of Sonoma which gives a very estery, banana-like character. This is a young vineyard and 1983 was the first year we picked from it. The fruit looked really good and the Brix, TA and pH at harvest were good as well but the character was not what I would call the typical Chardonnay.

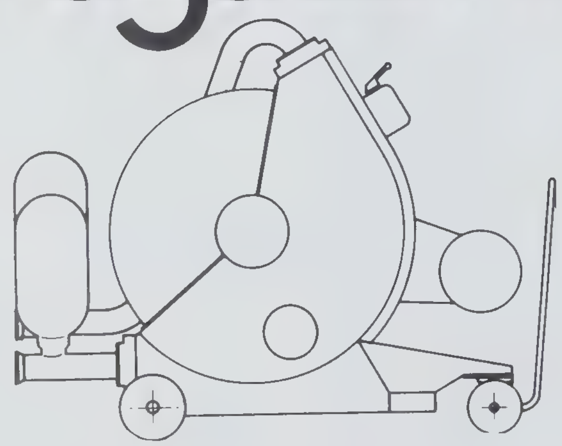
Other vineyards, particularly in the Glen Ellen area, give more of what I prefer as Chardonnay character. The buttery, toast aroma that comes from the fruit itself, not from fermentation and oak. These wines tend to have a lemony, citrus taste just after fermentation which complexes into that toastiness after ageing without ever seeing wood.

In most cases we know what sort of fruit characteristics each vineyard will give because we've had fruit from them for several years. We usually don't have trouble reaching the adequate maturity levels so we rely mainly on fruit characteristics that we expect from each.

Again, speaking generally, we've done well with fruit from young vines in their first cropping years on heavy soils. I've noticed that fruit from old vines (over 20-years-old) gives a fuller flavor at the window I mentioned but it's almost flabby. So we try to take fruit from these vines at lower sugar levels (22° Brix) to counteract this.

Another interesting point affecting maturity levels is the con-

ragazzini



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version ratio. We've been aiming at 13% alcohol with a conversion ratio of 55-56%. This translates to 23° Brix, but now with 57-58% we can pick at lower sugars and have a different set of fruit characteristics to deal with.

I like to get Cabernet Sauvignon at 23-24° Brix. To me this makes the best wine. It has an olivey character. For our Proprietor's Reserve, we prefer the 24° Brix level because we want a full-bodied wine with lots of depth. This fruit comes from the Sonoma Valley while the fruit for our Vintage Varietal or Premium Cabernet comes from both Sonoma Valley and Sonoma County.

It is a mixture of fruit from different vineyards in both cool and warm areas. I prefer fruit from the warmer areas of the valley for Cabernet in most years. By this I mean warm region II because we can generally get the maturity levels we are after. In the cooler regions, like Carneros, in cool years you're struggling to get these levels.

In this area I've noticed most differences in fruit and wine characteristics from season to season rather than from vineyard to vineyard in the same season. For example, our Eagle Vineyard in 1980. That was a cooler year with a warm spell at the end. The fruit had excellent balance. The wine had a very herbaceous, almost vegetative character. '81 was a much warmer year, the summer was hot, harvest was hot and everything was harvested about 2-3 weeks ahead of schedule.

These wines are softer and have more olivey, chocolatey character. They don't have the bell pepper/vegetative character. The harvest data for '80 were 25.5° Brix, 0.75-0.77 TA and 3.42 pH and for '81: 24° Brix, 0.82 TA and 3.54 pH. You can see the harvest data doesn't always give you the whole picture.

Simi Winery, CA

PW: How do you determine grape maturity?

Zelma Long: As we get more and more aware of grape quality for winemaking, we can decrease our dependence on sugar as the only parameter of maturity. It's obvious when you know the vineyards, that the grapes don't always reach the same flavor ripeness at the same sugar levels every year.

To me, maturity is when the fruit reaches maximum flavor. We have a fairly large range in what we consider to be optimum sugars here because I don't really know from year-to-year if the flavors will be more intense at 21° Brix or at 23° Brix.

We look at ten facets in determining grape maturity: Brix, sugar per berry, aroma assessment, TA, pH, malic acid, condition of the vines and grapes, color, grower comments and opinions, and climate of the vineyard. We rely mainly on Brix, sugar/berry, aroma assessment, vine and grape condition and grower input.

Brix indicates how much alcohol will be in the wines but sugar/berry is a better indication of real maturation. It separates true maturation (physiological accumulaltion of sugar in the grape) from dehydration or the dilution phenomenon caused by external circumstances that can affect Brix readings. For example, Brix readings may go up while berry weight decreases. Relying on Brix readings, you would say that the berries were ripening (accumulating sugar) but they are actually just dehydrating. There is no increase in sugar/berry.

For aroma assessment, we evaluate juice from our field samples prepared by the following procedure: The berry sample from the vineyard is crushed in a stainless steel cone crusher so that every berry is broken. 2 g/l pectolytic enzyme is added to the juice to maximize clarity, and 30 mg/l SO_2, plus 30 mg/l sodium erythorbate (ascorbic acid), to minimize oxidation. The juice is centrifuged at 6,000 rpm for three minutes and decanted (approximately 40 ml) into wine glasses with cover glass.

When we sample, we do several vineyards of one variety at a time. Five of us do the aroma assessments in a 'double-blind' manner, i.e. without knowing grower, analysis or others' scores, only the juice variety. We score intensity of aroma from 1-10 and quality of aroma on the same numeric-value scale. We've used this technique for two years, and have found that we can learn to consistently recognize subtle differences in both quality and intensity of aromas.

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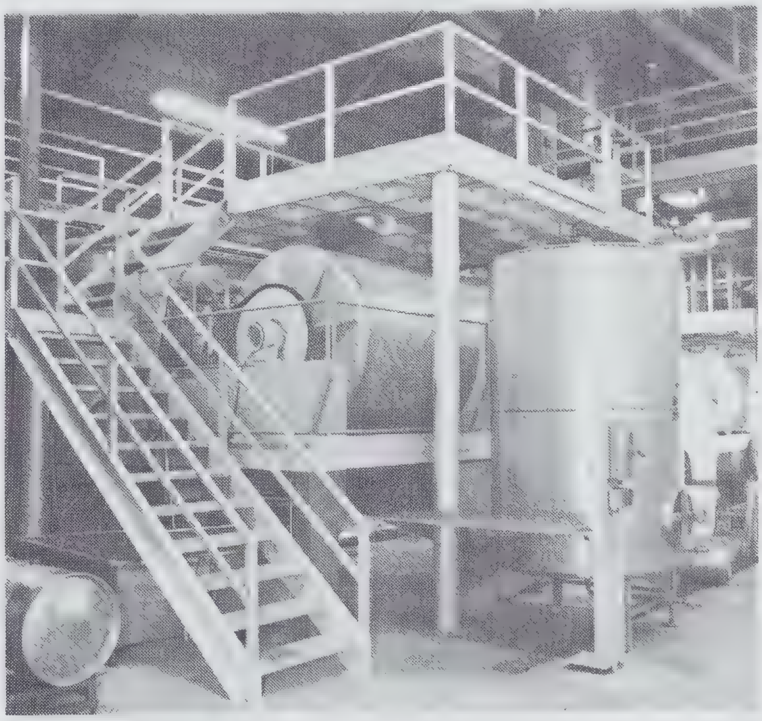

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I: No aroma at all: 0 points
Neutral: aroma of neutral juice: 1-2 points
Slight varietal aroma: 3-5 points
Distinctive varietal aroma: 6-8 points
The most intense varietal aroma: 9-10 points
Q: Spoiled or off-quality: 0 points
Broad, uninteresting, unpleasant aroma: 1-2 points
Some pleasing varietal character: 3-5 points
Attractive varietal aroma, very nice: 6-8 points
Elegant, fine distinctive varietal characteristics: 9-10 points

Aroma assessment works particularly well in distinctive flavored grape varieties like Sauvignon Blanc and scores show progressive increases as the grapes ripen. These assessments give us a good idea of the differences in fruit intensity from year-to-year. For example, in 1983 it didn't seem to us that our Sauvignon Blanc was as intense as it was the previous year. This has certainly shown up in the wines.

We track pH mainly as a guide to knowing our vineyards and for making grape purchasing and winemaking decisions. Grapes from some of our vineyards come in at higher pH readings than others for example. But all are within acceptable limits so I usually don't use this parameter when deciding to pick.

We used to monitor malic acid because we thought decreases in malic acid levels could be part of grape maturation. We found that the proportion of malic acid to total acid remained relatively constant from 19° Brix until harvest. It's apparently not an indicator of maturity so we don't routinely monitor it anymore. We do monitor it in the tanks to determine acid adjustments, but we only spot-check field samples if we think there may be a problem.

Vine and grape condition are very important in determining harvest time. If the vines don't look as if they are capable of any more photosynthesis there's not much point in leaving the grapes on the vine. In the grapes I look at color and texture — are the green grapes turning gold? Softening can indicate normal maturation. Yet grapes can be soft enough and skins thin enough that further time on the vine poses severe weather risk.

Climate is also important in determining grape maturity. I feel that maturity tends to occur at lower sugars in cool regions and in cool years. For example, say I had Chardonnay grapes at 21° Brix in two vineyards: one in the cooler Vineburg and one in the warmer Alexander Valley. I would say that the Vineburg grapes would likely be closer to maturity than those in Alexander Valley.

It is similar with vintage years. In 1982 we harvested both Cabernet Sauvignon and Chardonnay at 22° Brix. Our Cabernets are huge wines, not high in alcohol but high in color, flavor, tannin and aroma. The Chardonnay had good flavor at 21-22° Brix. I think many people waited for higher sugars and were disappointed when the actual quality decreased.

PW: What factors do you think emphasize varietal characteristics or aromas in the vineyard?

ZL: A large canopy and dense foliage will intensify varietal character. But sometimes this is bad. With Sauvignon Blanc,

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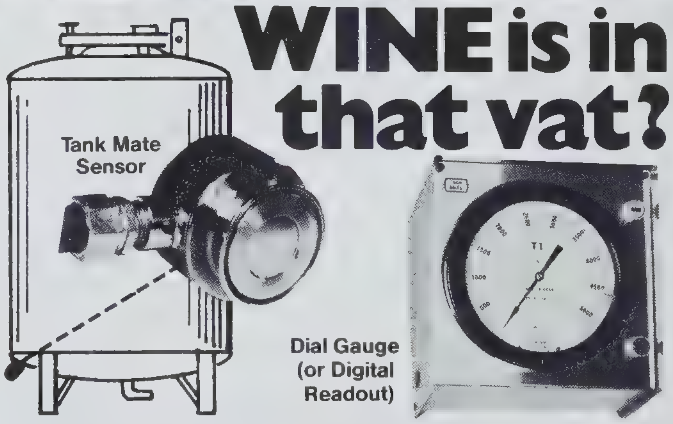

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there is more of the grassiness when the vines are on deep rich soils and have large canopies than when they are on shallow soils and have smaller canopies. Similarly, Cabernet Sauvignon tends to have more of that vegetative character in large canopy situations.

PW: What are your concepts of over-ripe and under-ripe grapes?

Dave Ramey: One of the key things relative to processing choices in the winery is the integrity of the grape skin. As the grape matures, the skin cells become less turgid, more flaccid, so they are more subject to rupturing. If, due to vineyard or weather conditions, there is an imbalance between sugar accumulation and 'ripening', the grapes may reach 25° Brix but still be firm and, essentially, unripe. Conversely, in a very cool vineyard, or due to rain, the grape skins may start to deteriorate if left on the vine too long, even though they're only at 20° Brix or so.

Those are somewhat atypical situations, though. Commonly, one associates 'greener', harder fruit with lower sugars, and softer, more mature fruit with higher sugars. When faced with working with either of these types of fruit, there are several things that can be done in the winery to compensate.

For less than fully ripe whites, one might use longer skin contact to make a fuller, broader wine, combined with barrel fermentation in newer oak, extended yeast lees contact and malolactic fermentation. For immature reds, warmer fermentation temperatures, more frequent pump-overs, longer skin contact and newer oak barrels. The lower alcohols allow the use of new cooperage with less fear of over-oaking, while the new tannins add body.

In cases where grapes have reached their full flavor and maturity at low sugar levels, we have chaptalized successfully with 50° Brix white grape concentrate. The resulting wines had tremendous fruit with very good color and tannin.

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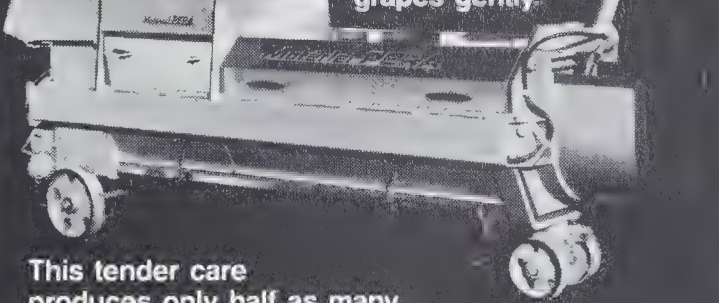

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Watching the change and fluctuation of the amount of sugar in an individual grape during ripening will give a picture of what's happening to the grape and the vine. That information is not provided by merely reading the Brix of a field sample. Brix reports concentration of soluble solids – the weight in grams of soluble solids/100 grams of juice. Sugar/berry reports absolute changes in sugar status of the grape. Sugar/berry is calculated using average berry weight of a 100 berry sample and the Brix of the sample.

Sugar/berry calculation is made as follows:

1. A random sample is taken of a vineyard and the sample is taken as whole grapes. From the sample, 100 berries are randomly selected and weighed. The sample is crushed; its Brix is checked.
2. Sugar/berry is calculated with the following formula:

$$\frac{\text{Grams soluble solids}}{\text{100 gram juice}} = \frac{X}{\text{weight of 100 berries}}$$

X = soluble soilds/100 berries

$\frac{X}{100}$ = soluble solids/berry which, since most grape juice solids are sugar, we call 'sugar/berry'

Before analyzing the meaning of sugar/berry, one should consider what is happening physiologically to a vine during maturation. During the period of time that grapes are sampled prior to harvest, there is a gradually increasing Brix and an increasing weight of the grape. During this period of time the grape is a sink for the accumulation of carbohydrates.

When one looks at sugar accumulation on a per berry basis in normal maturation, one should see a consistent increase in the sugar per berry as well as a weight gain in the total grape weight. That gain would be presumably increase in seed size, increase in water, and increase in sugar.

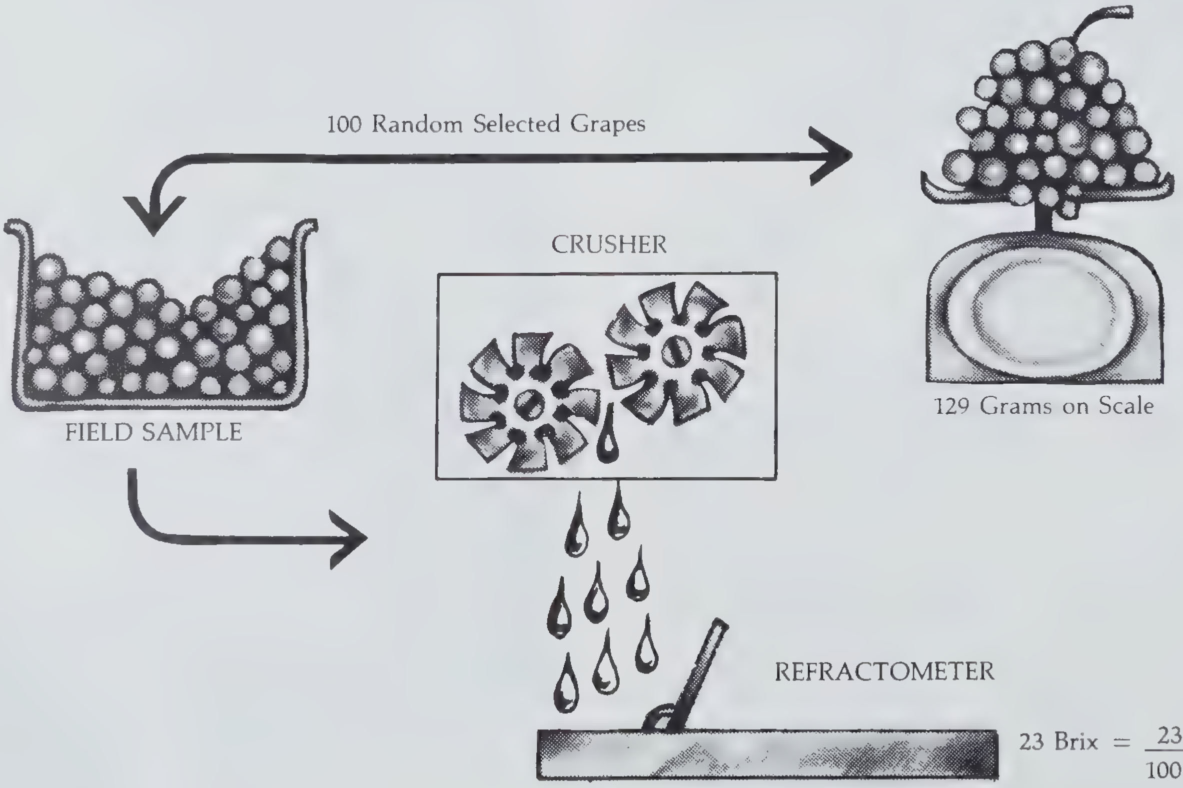
If, however, something interrupts the normal ripening, it is possible that other parts of the vine may become stronger sinks than the grape, and the vine may start to move carbohydrates to other areas of the vine. Therefore, the ability to watch what is happening to sugar on a per/berry basis can be an indication or a clue to the physiological status of the vine.

1983 Field Sample

Chardonnay	8/15	8/25	9/5	9/12	9/26	9/29
Brix	12.3°	15.1°	18.3°	20.4°	22.4°	23.0°
pH		3.21	3.06	3.11	3.26	3.16
TA		18.45	13.56	12.18	9.47	9.75
100 Berry Wt (gm)		127.4	144.5	151.1	146.3	151.8
G Sugar/100 Berries		19.2	26.4	30.8	32.8	34.9

(Classic maturation)

CALCULATING SUGAR PER BERRY



$$23 \text{ Brix} = \frac{23 \text{ gm sol. solids}}{100 \text{ gm juice}}$$

$$\text{Sol. Solids per Berry} = \frac{23}{100} = \frac{x}{129} = 29.67 \text{ gm sol. solids/100 berries}$$

$$= .2967 \text{ gm/berry}$$

Sugar/berry data allows one to watch changes in water status of the berry based on the assumption that as the berry weight increases, since soluble solids at maturity usually represent a range of 20-24% of the weight, the balance of the changes in berry weight will be changes in water. If the water status in the grape decreases, it may be a clue that dehydration is occurring. If it increases far beyond the rate of increasing sugar, it would be an indication of dilution.

In the following example, there are two 100 berry samples taken five days apart. The samples show a decrease in concentration of soluble solids from 22.2° to 21.4° Brix, but they show an increase in sugar/berry. If one had looked only at the Brix, one might conclude that there was a simple case of dilution (perhaps due to rain).

But, if one looks at the samples on a sugar/berry basis, one can see that although water has increased in greater proportion than the sugar, there is a sugar/berry increase from day 1 to day 5, indicating that there is still ripening occurring.

The implication to picking?

Since the vine seems to be continuing to accumulate sugar in the berry in a normal pattern, as long as the grapes are in good condition, wait for the sugar and water to come back into a more normal relationship before harvesting.

Interpretations of sugar/berry and berry weight changes can be made as follows:

I. Increase in sugar/berry indicates that the vine is using the grape as a sink and presumably indicates normal maturation for the grape.
  a. Sugar/berry increase coupled with a decrease in berry weight would indicate maturation plus some dehydration.
  b. Sugar/berry with little or no change in berry weight would indicate maturation.
  c. Increase in sugar/berry with an increase in berry weight might indicate two things:
    1. If sugar/berry stays the same but berry weight decreases, dehydration is indicated.
    2. If sugar/berry stays the same and berry weight increases, dilution or uptake of water is indicated.

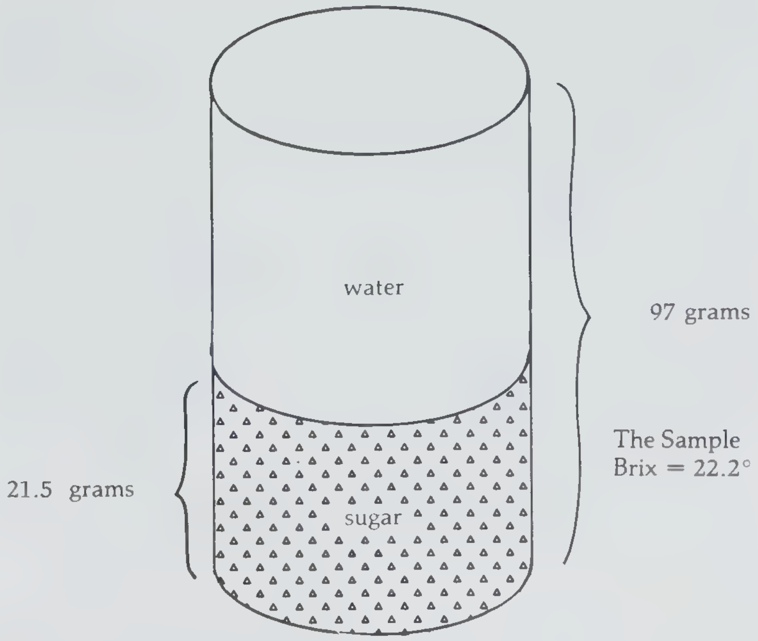
II. A decrease in sugar/berry always indicates some net loss in sugar from the grape. Two causes for this could be postulated:
  (1) A change in the 'sink' of the vine that has resulted in removal of the carbohydrates or sugars from the grape to other areas of the vine;
  (2) A respiration of sugar from the grape that exceeds any import of sugar into the grape by the vine.
    (a) Sugar/berry decrease coupled with berry weight decrease indicates sugar export plus dehydration.
    (b) Sugar berry decrease coupled with berry weight staying approximately the same would indicate sugar export.
    (c) Sugar/berry decrease coupled with increase in berry weight would indicate sugar export plus dilution.

Use of Sugar/Berry Information:

My experience with sugar/berry interpretation in field samples is limited to the 1983 vintage. Like all new tools, it needs to be used for several years before a feeling for what it means can be well developed. I believe, however, that use

100 BERRY SAMPLE

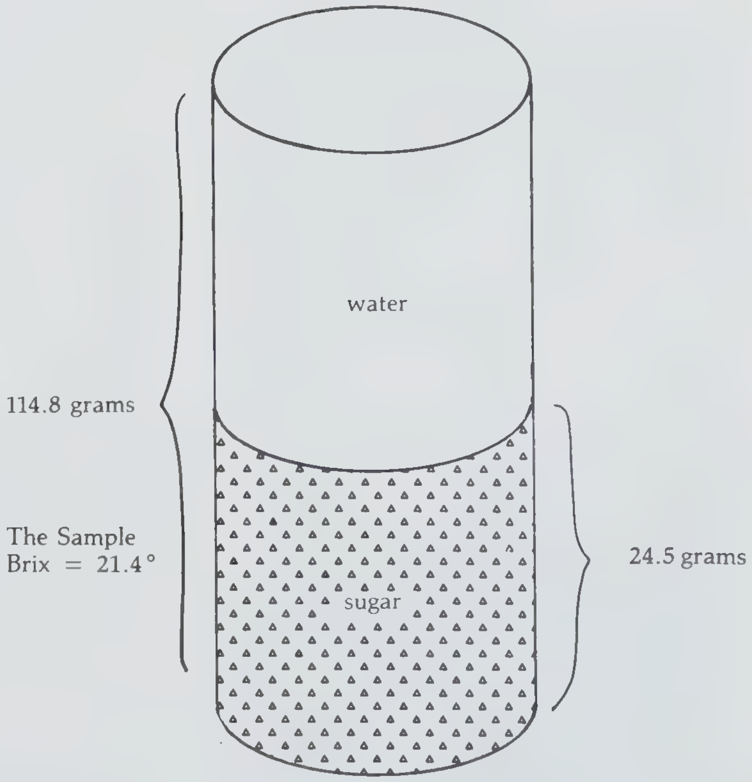
DAY 1



# Berries:	100
Wt./100 berries:	97 grams
Measurable Brix:	22.2°
Sugar/100 Berries:	21.5

$$\left(\frac{22.2}{100} = \frac{x}{97}\right)$$

DAY 5



# Berries:	100
Wt./100 berries:	114.8 gms
Measurable Brix:	21.4°
Sugar/100 Berries:	24.5

$$\left(\frac{21.4}{100} = \frac{x}{114.8}\right)$$

of sugar/berry information coupled with changes in Brix, pH, TA and berry weight may give a more informed basis for making harvest decisions.

Two examples follow:

Example 2, Cabernet Sauvignon—shows how assessment of berry weight and sugar/berry can explain changes in Brix. At first glance, it might appear that between 9/24 and 10/12 some real maturation took place in this grape vine, but in reviewing berry weight and sugar/berry, in fact there was a net sugar loss in the berry and the Brix increase was due strictly to dehydration. It may have been worth waiting for harvest until 10/12, but the Brix was gained at the expense of a substantial acid loss and a slight pH change.

Example 1, we see from 10/3 to 10/7 a Brix increase. Berry weight and sugar/berry data indicate that it came because of a slight dehydration or loss in berry weight and because of the very small increase in sugar/berry. This gain may be significant to a winemaker in terms of final alcohol of the wine, but was it significant in terms of final balance? It was gained at the expense of a substantial pH change and minor TA loss.

I believe that more experience in working with and interpreting berry weight and sugar/berry changes will allow us to better understand what Brix changes really mean and whether gaining these changes in Brix is really gaining us maturity, quality and balance in our wines.

1983 Field Sample

Example 1

Cabernet Sauvignon	9/22	10/3	10/7
Brix	21.3°	21.3°	22.2°
Brix	21.3°	21.3°	22.2°
pH	3.14	3.24	3.34
TA	7.41	6.62	6.56
100 Berry wt	85.4	92.7	91.2
G sugar/100 berries	18.2	19.7	20.2

What was really gained by picking after 10/3?

Some Brix increase
pH increase
Acid loss
Berry weight decrease
Negligible change in sugar/berry

Example 2

Cabernet Sauvignon	9/24	10/12
Brix	20.5°	21.0°
pH	3.28	3.31
TA	8.40	7.44
100 Berry wt	125.5	116.0
G sugar/100 Berries	25.7	24.4

What was really gained in this picking?

pH went up
Acid decreased
Berry weight decreased (dehydration)
Sugar/berry decreased
Brix went up; but was anything else really gained? No!

INTERPRETATION OF SUGAR PER BERRY

SUGAR PER BERRY	BERRY WEIGHT: decrease	same	increase
Increase	maturation plus dehydration	MATURATION	with moderate increase in berry weight maturation with major increase in berry weight = maturation & dilution
Same	DEHYDRATION	NO CHANGE	DILUTION
Decrease	Sugar Export plus Dehydration	SUGAR EXPORT	Sugar Export plus Dilution

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Improving Accuracy of Crop Estimates

Pat Summers

Bob Steinhauer, vineyard manager for Beringer Vineyards in St. Helena, CA spoke earlier this year at the UC Davis/CAWG Grape Day on the imperfections of the 1983 harvest tonnage predictions. The fact that the California Crop and Livestock Reporting Service had been off for the previous harvest was not of particular interest to Steinhauer.

Estimates at Beringer in 1983 were as close as 1% for the whole and as distant as 25% for a specific variety. "I have reflected on predicting techniques a great deal," Steinhauer says. "Our approach in the future will be to reduce the number of blocks we count clusters in. Also, we are going to initiate other measurements to determine our estimates, and try to make them closer to the actuals."

What are these 'other measurements'?

"We are still looking at what we should be doing," Steinhauer explains, "and are trying to talk to other people to find out what they are doing. Many different techniques are being used, none of which, that I know of, are absolute.

"Mainly, we go out and visually inspect our vineyards, and use that visual inspection—plus past actual yields—to develop an estimate. Since 1979, we have made a cluster count: eight vines, the same eight vines in every block, every year. We want to see, on a year-to-year basis, if there is any correlation between that cluster count and our actual yields. Obviously, one year of data is not indicative, so we have five years' data.

"We separated out those blocks in which we knew conditions had changed. We took blocks that were relatively uniform in that five-year period in terms of no major changes. We did a statistical analysis where we related those cluster counts to the actual yields. What we found was that the correlation between yields and the actual bunch count was very low. The factor of cluster count made up about 50% of the yield, and that was in the best blocks. We had some blocks in which there was no correlation at all.

Steinhauer sent the results to Amand Kasimatis at UC Davis, who tried a different technique. Taking all the varieties, cluster counts and all yields, he gave each variety a crop-factor, such as so many clusters per pound. His correlation indicated about 50% of the crop could be identified by the cluster counts, if you put this factor against the cluster weights. It might take two or three clusters of Chenin Blanc to equal a pound, or five clusters of Cabernet Sauvignon.

Steinhauer will retain the cluster count, "We will continue to count the eight vines. One of the big questions is, is eight vines enough? I don't know the answer to that. There is a possibility that some place we might try to do more in a given block on a trial basis. We are not looking to count more vines, we are looking to count less. It takes a great deal of time to **correctly** count the 2,000-3,000 vines we are counting each season. Only our managers do it, the same person to the same vines."

In 1984 he will look for other factors to complete the missing 50%. "We are still looking at what we should be doing. We are probably going to get cluster weights at veraison, and also at harvest time, so we can do a relationship between cluster count per vine and the weight at veraison. Then we can see if there is a standard increase in cluster weight from verasion until harvest.

"If we can determine that for a given variety, in a given block, then it would probably make sense for us to go out and make a cluster count early in the season, weigh a set number of clusters or the total number of clusters on a given vine at veraison in order to make the prediction as to what the final crop was going to be. If we could get within 5%, plus or minus, of that accuracy for a given block we would be ecstatic."

Steinhauer says they will take at least 100 clusters off those eight vines, at random, during verasion and make cluster measurements, and at harvest time they will probably take another 100 clusters to see the percentage gain. Of course there needs to be a way to see that the first 100 clusters taken do not affect the second measurement. Steinhauer explains, "If we wait until veraison, there will probably be a small effect in terms of increased weight on the clusters that remained. We always take 200 berry samples and weigh them too, so we will have other data."

Under the present program, if the prediction is 10% plus or minus—a 20% margin of error, they feel they have done well, though recognizing it is not sufficient for their needs. "Our viticulturist is talking about making some measurements like the Objective Survey Management Measurements," Steinhauer continues. "That would include shoulder length and length of cluster. We also need some way to measure set. Set is highly variable here, depending on weather conditions; and certainly different clones set differently."

Steinhauer does not claim to have an answer, and he is interested to know what others are doing in this field. Who out there is counting, who is working with formulas and who is going out and looking at their vineyards and making judgements from what they see? And how reliable is any of this?

Accurate predictions are important, says Steinhauer. "Beringer is growing and our winery is sized to meet that need, not 20% over or 30% over, and it creates some real problems for us if that occurs. Not only that but we have X number of white fermenters, X number of red fermenters and the varieties are not interchangeable. It is important that we know for scheduling purposes and for capacity purposes where our crop is."

Steinhauer notes that it is also helpful to have the expected amount of any one variety so that the marketing people can market it efficiently. For his own department, it is well to be able to budget for the proper number of vineyard personnel.

Steinhauer is working beyond the yearly forecast into what he calls 'trends'. "This is really one step beyond," he continues. "It is making an estimate for the future, against a ten-year plan. We are looking for trends. If a given variety is growing in terms of sales, or we project that we are going to have a new product, we want to know if that product is going to be available—if the raw product is going to be available for that four or five years out. We only want to plant vineyards in the right location that grow really superb grapes, so we look at these projections to see whether or not we can purchase this grape, or whether we can plant this grape for our future needs."

PRACTICAL WINERY is interested in hearing from others about methods of predicting the crop. If you have a method of predicting yields, drop us a post card with your name, address and phone number and we will be in touch.

FROM THE VINEYARD

Economics of Producing Chardonnay

If you ask just about anyone their impression of Chardonnay, the one description that universally would be agreed upon would be 'expensive'. Growers, wineries, wholesalers, retailers, restaurateurs, and particularly consumers all have a common complaint—Chardonnay is too costly. There does not seem to be any single culprit or explanation for this cost phenomena—low yields, tremendous capital requirements, costly supplies, expensive logistical and marketing costs all are major contributing factors.

Through a two-part series, the economics of the entire process from the growing of the Chardonnay grape to the distribution of the finished bottle of wine will be examined. Part I will concentrate on the vineyard aspects. Part II (PW September/October 1984) will look at winery operations.

Data for this analysis comes from a mix of large and small producers in the Napa Valley. No inference is intended that the reported data is typical of other viticultural areas, or even all the vineyards and wineries within Napa Valley. Where practical, ranges of experience are provided in order to give an indication of the degree of variation.

George M. Schofield

In order to understand the economics of Chardonnay grapegrowing in Napa Valley, a review of recent historic production, acreage, and especially, yields/acre is necessary (Table I). The seven- fold increase in Napa Chardonnay production, from slightly under 2,000 tons in 1976 to an excess of 14,000 tons in 1983 is significant. However, this effect is somewhat deceiving as the 1976 crop was only about 50% of normal.

Table I gives the first clue to the economic plight of Chardonnay. The 1976-1983 eight-year average yield/acre is only 2.94 tons. This average represents a mix of irrigated and non-irrigated vineyards, old and new clones, short crops (1976) and bumper harvests (1982). Compared to 4.75 tons/acre for Sauvignon Blanc or even 3.31 tons/acre for Cabernet Sauvignon, Chardonnay is indeed a shy-bearing grape variety.

Analysis of Sonoma county Chardonnay shows an average yield of 2.56 tons/acre in the same eight-year period while the Lake county/Mendocino area had an average yield of 2.69 tons/acre. The Central Coast region, including Monterey, San Benito, San Luis Obispo, and Santa Barbara counties averaged only 2.20 tons/acre.

Low yield is a key element behind the relatively high prices for Chardonnay grapes. In 1983, the average price/ton in Napa Valley paid by wineries to third-party growers was $1,267/ton. Prices ranged from $450 - $2,304/ton, but a more meaningful range of $850 - $1,550/ton can be arrived at by excluding the lowest and highest 5%.

Table II provides a historical perspective of prices paid for Napa Valley Chardonnay. The significant increase in 1977 occurred as a result of the shortage from a second consecutive drought year combined with accelerating demand growth. Relatively modest, but steady price gains followed during the 1978-1980 period. The 24% price increase in 1981 basically reflected the inability of the supply side to keep pace with demand. However, the huge 1982 bumper crop (yield of 35% above the most recent 8-year-average) as well as the USA's economic recession resulted in a moderation to a 3% price rise in 1982 and a subsequent drop of 9% in 1983.

Operating costs, as with any business, are a fundamental economic consideration. 1984 farming costs for a mature vineyard are estimated at $1,480/acre (Table III). Depending on the size, location, and viticultural practices, costs vary from $300 on the low side to $500 on the high side. To these

Table I
Chardonnay - Napa County

Year	Tons of Production	Equivalent Mature Acres*	Yield Tons Per Mature Acre
1976	1,957	1,261	1.55
1977	4,818	1,687	2.85
1978	5,345	2,220	2.40
1979	6,798	2,574	2.64
1980	9,060	2,857	3.17
1981	9,905	3,016	3.28
1982	13,547	3,413	3.96
1983	14,460	3,952	3.66
8 Year Average			2.94
4 Year Average (1980-1983)			3.52

*Vines under 6 years of age are discounted by the estimated degree of immaturity

Table II
Chardonnay - Napa Valley

	Average Grape Price		Est. Revenue Per Acre	
	$/Ton	% Increase vs. Prior Year	$/Acre	% Increase vs. Prior Year
1976	$ 561		$ 870	
1977	$ 835	+49%	$2,380	+174%
1978	$ 897	+7%	$2,153	(9%)
1979	$ 978	+9%	$2,582	+20%
1980	$1,098	+12%	$3,481	+35%
1981	$1,364	+24%	$4,474	+29%
1982	$1,398	+3%	$5,536	+24%
1983	$1,267	(9%)	$4,637	(16%)

Table III
Napa Valley Chardonnay Farming Costs

$/Acre	Estimated 1984
Pruning, Suckering, Trellising	$ 400
Cultivation, Fertilization, Weed & Pest Control	240
Irrigation & Frost Protection	70
Harvest	420
Farm Shop	170
Management	120
Other Costs	60
Total Cash Costs	$1,480
Depreciation	600
TOTAL	$2,080

Table IV
Chardonnay - Napa Valley
Vineyard Development Timetable

	Vineyard	Winery
1/1/84	Purchase Land	
1984	Prepare Land	
Spring, 1985	Plant Rootstock	
Spring, 1986	Bud	
Summer, 1986	Up The Grapestake	
Fall, 1987	0.7 Tons	
Fall, 1988	1.0 Tons	
Fall, 1989	3.0 Tons	Ferment
Fall, 1990	3.7 Tons	Cellar
Fall, 1991		Age

figures must be added an annual depreciation provision averaging about $600/acre, but which may vary subject to the age of the vineyard and the degree of mechanization.

Far overshadowing farming costs in the economics of producing Chardonnay is the magnitude and timing of capital investment. Starting with bare land, $15,000/acre is a common figure for a good Chardonnay vineyard site in Napa. Hillside plots, or land with poor drainage or lacking water, can be found in the $8,000-$10,000 range. Besides the $15,000/acre land cost, an additional $12,000/acre is likely to be required over 1984-1987 period to plant and develop the vineyard. If interest costs were computed on the entire investment, almost another $13,000 of costs would be involved, raising the total investment to slightly under $40,000/acre.

The timing and components of the estimated investment are shown in Tables IV and V. A vineyard planted in 1985 wouldn't provide a full crop before 1990, and if the vineyard owner had an integrated winery operation, it would be close to the fall of 1991 before any significant positive cash flows were generated.

The key to understanding the overall economics of a vineyard, as with any farming operation, is to analyze and summarize results on a per acre basis. Total production, revenue, unit costs, and capital investment all have to be related together. Tables VI and VII illustrate first the pre-tax income/acre and then the correlation of the return with the investment required to generate the income. The advantage of such analysis is that it permits comparisons, not only with different varieties and crops, but also alternate investment opportunities.

The vineyard financial analysis was projected under three different sets of circumstances. First, a 1974 vineyard with a relatively low yield and capital costs and 9% fixed rate financing, is projected to generate $1,040/acre pre-tax income in 1984. The second example represents a grower who planted his vineyard in 1978, is estimated to have 10% higher yields, but with higher capital costs and 12% financing, the 1984 pro-forma pre-tax income drops to $750/acre. The third case presumes that a 1985 planting, using an 8% inflation factor, would produce a pre-tax income of $2,540/acre on a mature crop in 1990.

Until the investment base is included, the net income/acre analysis looks financially attractive. However, Table VII shows the stark realization of the capital intensity. In all three cases, so much capital is required that income being generated provides a pre-tax return on total assets below current interest rates. Ten years later, the 12% return on assets from the 1974 vineyard looks attractive only because of the lower

Table V
Estimated Vineyard Development Costs

Napa - 1983

($ Per Acre In 000)

	1/1/84	1984	1985	1986	1987	Total
Land	$15.0					$15.0
Land Prep. (Fumigation)		$1.2				$ 1.2
Drain Tile		1.4				1.4
Reservoir		1.4				1.4
Sprinkler Systems			1.6			1.6
Planting			1.1			1.1
Budding				.7		.7
Trellis System					1.2	1.2
Farming				1.5	1.9	3.4
SUBTOTAL	$15.0	$4.0	$2.7	$2.2	$3.1	$27.0
Interest @ 14%		$2.7	$3.0	$3.3	$3.8	$12.8
TOTAL	$15.0	$ 6.7	$ 5.7	$ 5.5	$ 6.9	$39.8

Table VI
Napa Valley Chardonnay Vineyard
Pro Forma Income Per Acre

	1984 Proforma		1990 Results
	1974 Planting	1978 Planting Old Clone	1985 Planting New Clone
Tons Per Acre	2.8	3.2	4.0
$/Ton	$1,300	$1,300	$2,060
Revenue Per Acre	3,640	4,160	8,240
Growing Crop Costs	1,480	1,480	2,350
Profit Margin	2,160	2,680	5,890
Depreciation	270	400	600
Income Before Interest & Taxes	1,890	2,280	5,290
Interest	850	1,530	2,750
Pre Tax Income ($/Acre)	$1,040	$ 750	$2,540

Table VII
Napa Valley Chardonnay Vineyard
Pro Forma Return On Investment

	1984 Proforma		1990 Results
$/Acre	1974 Planting	1978 Planting	1985 Planting
Income Before Interest & Taxes	$ 1,890	$ 2,280	$ 5,290
Pre Tax Income	$ 1,040	$ 750	$ 2,540
Vineyard Capital	$12,000	$17,000	$27,000
Start-Up Interest	3,800	6,800	12,800
Total Asset Investment	$15,800	$23,800	$39,800
Vineyard Equity	$ 7,400	$11,900	$20,900
Return On Assets	12%	10%	13%
Return On Equity	14%	6%	12%
Long Term Interest Rate	9%	12%	14%

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capital base and 9% financing then available. However, the 10% return on assets for the 1978 vineyard is two percentage points below the 12% term financing costs. In essence, reverse debt leverage is occurring. To provide the creditor with a 12% interest payment, the 1978 owner must accept a 6% return on equity.

The new 1985 vineyard requires assumptions of an average four tons/acre yield and an 8% compounded annual price increase for the $40,000 investment to earn a return close to today's 14% long-term financing cost. Even then, no consideration is given in the simplified projection for the five to six-year period during which no return was earned.

A more sophisticated financial analysis incorporating present value techniques, normal tax considerations, and a 8% compounded annual appreciation in land value was also performed. This analysis resulted in a 12% after-tax discounted cash flow return on investment at the end of year 2014. Accordingly, the financial attractiveness of producing Chardonnay grapes hinges on the assumed long-term appreciation of the underlying land.

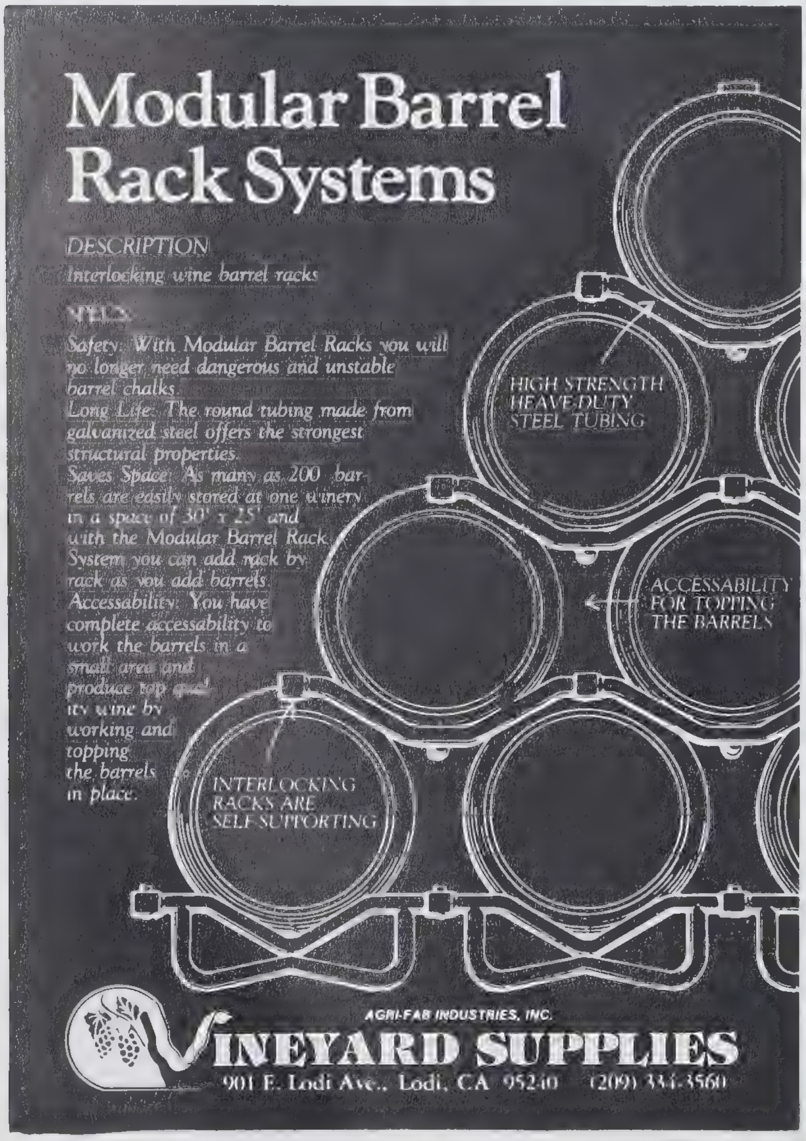
In the interim, the emerging economic picture of a Chardonnay vineyard is a low-return, high-risk venture. Chardonnay is a shy-bearing agricultural product which tends to be highly subject to farming risks, especially early frost, mildew, and bunch rot. Chardonnay vineyards near creeks have a high susceptibility to Pierce's Disease, an incurable malady which over a few years can completely decimate productivity.

Grape-growing has changed remarkably over the past 15 years. Grapes were once predominately planted in low-cost, marginal farm land, purchased with 6% interest debt. The combination of bare land costs quadrupling and interest rates more than doubling has radically affected the economics of vineyard operations. Financing costs/acre for newer vineyards now often exceed out-of-pocket farming costs. This financial analysis demonstrates that Chardonnay, as with almost all other grapes and many other agricultural products, cannot justify or support the land value placed on the farmland.

It is unlikely that vineyard economics will cause land to decrease much, if at all. Land, like precious metals and gems, frequently has a value far removed from utility values. A more pragmatic approach is for the vineyard owner to treat his land costs as a real estate investment at least partially separate from his vineyard operation. The difficulty herein, is that under this premise, the future of the vineyards may become secondary to the real estate market.

Based on the economics shown, it is difficult to envision the vineyards contributing much relief to the universal complaint of Chardonnay being expensive. Cost and yield factors suggest that current grape prices are more likely to rise than decline. Bumper crops or other abnormal events could cause a temporary decline, but the long-term survival of the vineyards seems predicated on either lower land and financing costs or higher prices for grapes.

As will be demonstrated in the following PW, Chardonnay grapes generally represent 50% or more of a winery's production costs and 1/3 of the winery's FOB wholesale price of a bottle of Chardonnay. The wine industry's wholesale and retail pricing practice of percentage mark-ups results in a multiplier effect on producers' costs as reflected in consumer prices. Those interested in comprehending the economics of the noble Chardonnay wines must therefore start as the wine does, in the vineyard.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BLAKE PRINTERY, 2222 Beebee St., San Luis Obispo, CA 93401 (805) 543-6843. **L3**

BOSWELL COMPANY, 305 San Anselmo Ave #313, San Anselmo, CA 94960 (415) 457-3955. **B2, B3**

BURKHART INDUSTRIAL SALES, 3654 W. Dry Creek Rd., Healdsburg, CA 95448 (707) 433-3265. **P3**

CALPAC CONTAINER CO., 33359 Central Ave., Union City, CA 94587 (415) 471-5091. **B8**

CELLULO CO., Finer Filter Products Div., 124 M St., Fresno, CA 93721 (209) 485-2692; Cranford, NJ (201) 272-9400. **D2, E2, F2, F3, F5, L1, T2, Y1.**

CENTRICO, Inc., 3400 Third Ave., Foster City, CA 94404 (415) 349-8900; 100 Fairway Ct., Northvale, NJ 07647 (201) 767-3900. **C1**

CHATEAU BOTTLERS, P.O. Box 2274, Napa, CA 94558 (707) 253-1254; 26 Woodland Ave., San Rafael, CA 94901 (415) 454-2355 **M2**

CHERRY-BURRELL Corp., 2400 6th St.SW, Cedar Rapids, IA 52406 (1-800) 553-8867. **F6, P3, T1, V1**

THE COMPLEAT WINEMAKER, 1219 Main St., St. Helena, CA 94574 (707) 963-9681. **B10, C2, C8, D1, F2, F6, H2, L4, L6, P1, P3, S1, S3, S4, T2, T4, V1**

CUSTOM COOPERAGE, 1194 Maple Lane, Calistoga, CA 94515 (707) 942-6902. **B2, B3, B6**

DATA CONSULTING ASSOCIATES, INC., 18000 Coleman Valley Rd, Occidental, CA 95465 (707) 874-3067. **C5**

EAGLE-PICHER INDUSTRIES, INC., 580 Walnut St., Cincinnati, OH 45202 (513) 721-7010. **D2**

ENCORE!, 860 So. 19th St., Richmond, CA 94804 (415) 234-5670. **B8, B11**

ETS (enological technical service), 1804 Main St., St. Helena, CA 94574 (707) 963-4806. **L5, M1, Y1**

ERICKSON TRANSPORT, PO Box 10068 G.S., Springfield, MO 65804 (800) 641-4595. **T5**

ERTEL ENGINEERING CO., 321 Fair St., Kingston, NY 12401 (212) 226-6023. **F2, F3, P3, T1**

ESTATE BOTTLING, PO Box 1743, Pleasanton, CA 94566 (415) 484-3062. **M2**

FELDMEIER EQUIPMENT, PO Box 178, Salina Station, Syracuse, NY 13208 (315) 424-1904. **V1**

FISCHER & SCHUG WINERY EQUIPMENT, 609 McCorkle Ave., St. Helena, CA 94574 (707) 963-3169. **B9, B10, B11, C1, C6, C7, C10, D1, F2, F6, H2, L2, L4, L6, P1, P2, P3, T3, T4, U1, V1**

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IRAPP, 195 Dry Creek Rd., Healdsburg, CA 95448 (707) 433-9471. **R1, T3**

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MOFFETT CO. INC., 6985 Via Del Oro A-5, San Jose, CA 95119 (408) 578-4910. **B2, B9, C8, B10, F2, F3, H1, L6, P1, S2, S4, Y1**

MONITOR MANUFACTURING, PO Drawer AL, Elburn, IL 60119 (312) 365-9403. **T3**

NALCO CHEMICAL COMPANY, 2901 Butterfield Rd., Oak Brook, IL 60521 (312) 887-7500. **F5**

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VINQUIRY, 301-D East Street, Healdsburg, CA 95448 (707) 433-8869 **C7, L5, M1, W2, Y1**

WATER DYNAMICS, 659 Main St., St. Helena, CA 94574 (707) 963-5822 **I3**

WESTEC, 195 Dry Creek Rd., Healdsburg, CA 95448 (707) 433-8829. **F6, P3, W3**

WILDEN PUMP & ENGRG CO., 22069 Van Buren St., Colton, CA 92324 (714) 783-0621. **P3**

WINE AND THE PEOPLE, 907 University Ave, Berkeley, CA 94710 (415) 549-1266. **B10, C9, D1, F2, F3, H2, L2, P1, P3, S4, W2**

WINERY EQUIPMENT SYSTEMS, PO Box 3361, Napa, CA 94558 (707) 257-1103. **B5, F6, P3, W3**

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